

VOLUME 3 NUMBER 5 MAY 1996

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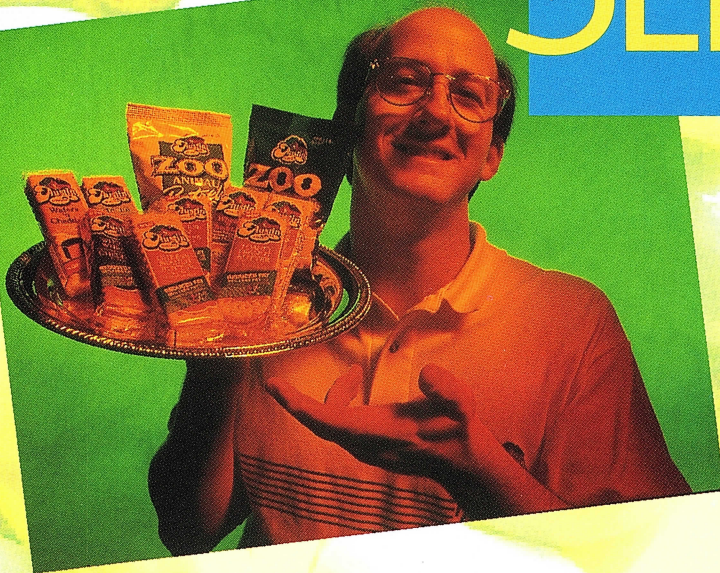


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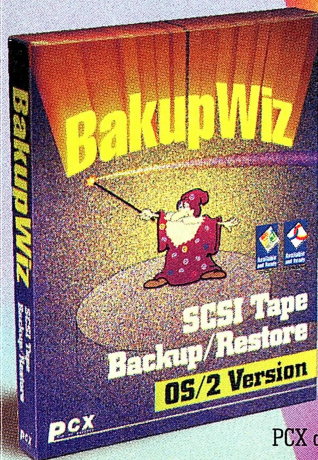
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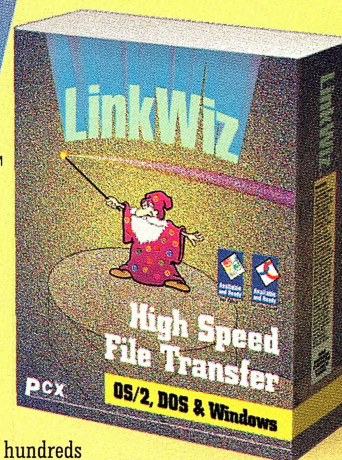
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The newest version of Lotus' groupware communications product offers hundreds of new features, a better user interface — and full OS/2 support. Let's take a look at how Notes 4 has changed from the administrator's perspective and what new capabilities it offers current users. *By J.C. Love*

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A text editor — for free! Actually, EPM, OS/2's enhanced editor, is a powerful and programmable tool that goes far beyond the simple capabilities of the System Editor. Here's a look at what EPM can do and how to tweak its settings to make it more usable. *By Bill Schindler*

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Postal and Rates

OS/2 Magazine (ISSN #1073-1547) is published monthly by Miller Freeman Inc., 600 Harrison St., San Francisco, CA 94107, (415) 905-2200. SUBSCRIPTION RATE in the U.S. is \$39.95 for 12 issues. Canadian and Mexican orders must be prepaid in U.S. funds with additional postage at \$10 per year. All other countries must be prepaid in U.S. funds with additional postage at \$20 per year for surface mail or \$40 per year for air mail. Second-class postage paid at San Francisco, CA, and at additional mailing offices. POSTMASTER: Send address changes to OS/2 Magazine, P.O. Box 1079, Skokie, IL 60076-8079.

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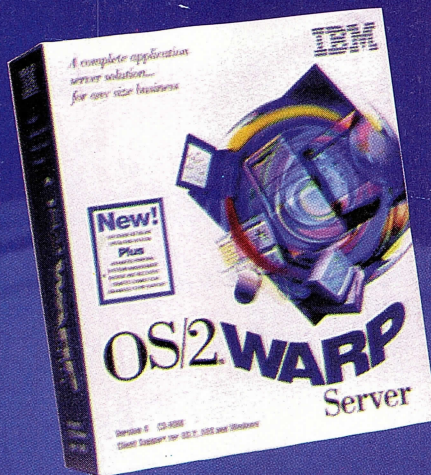
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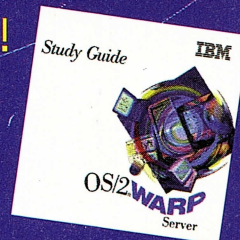
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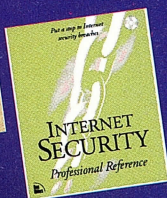
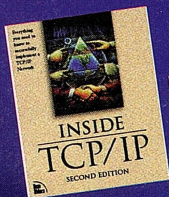
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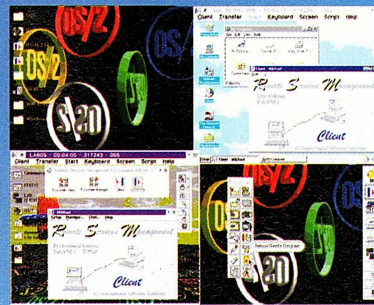
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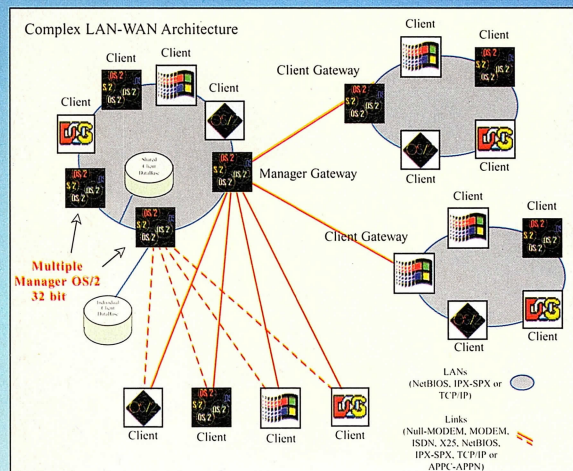
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Perspectives

No More War

It's generally accepted that computer journalists have the most credibility when they're not religious about the companies, products, or technologies they cover; when they start preaching, everyone loses interest. Bearing that in mind, I try to maintain the proper balance between my feelings as a long-term, loyal OS/2 user, while not acting as a zealot or an evangelist.

Many in the OS/2 community see no reason to maintain a balanced position. They're not merely passionate, or even just enthusiastic, about their preferred operating system, oh no. They view OS/2 as the bellwether of the epic struggle between mindless stormtroopers controlled by the evil Microsoft Empire and IBM's brave yet battered freedom fighters.

OS/2 Magazine's editors and contributors don't look at the world that way. No evil empire and its tyrannical conspiracies; no freedom fighters in a last-ditch stand against Windoze Everywhere. After all, we're technical writers, not election year politicians.

After March's "Road Kill" hit the streets ("Perspectives," p.7), we received heated feedback from some of our more fervent readers. They apparently expect OS/2 Magazine to lead IBM's cheering section in the OS Wars, and they don't hesitate to shoot the messenger when reports from the field aren't encouraging. (I particularly enjoyed the CompuServe thread that labeled me "Pessimist-in-Chief.") How dare you! they said. What, are you now in the pay of Microsoft? they accused. Whose side are you on? they wondered.

Some zealots want us to don micro-miniskirts, grab our pom-poms, and break into song each time IBM scores a touchdown (but keep politely silent when the Brawny Boys in Blue fumble the ball). As dutiful cheerleaders, of course, we must debunk every Microsoft claim and spotlight every Microsoft flop. To do otherwise will scare away potential OS/2 customers.

Alan in a miniskirt? That's not a pretty picture. So, we'll continue to call 'em like we see 'em. Although all our writers are *bona fide* enthusiasts, we're *not* IBM's cheerleaders or apologists. We're here to help OS/2 users get the most out of their chosen platform and to prod IBM into focusing on its customers. When that means lamenting OS/2 Warp's unhelpful error messages or protesting Big Blue's contradictory statements, that's what we'll do. When it means praising OS/2's end-of-year sales, applauding IBM's site consolidation, or presenting Editors' Choice Awards to outstanding software, we'll do that too.

Back to the epic struggle: Industry watchers, journalists, consultants, analysts, pundits, and self-proclaimed experts sure love their pseudo-military jargon, don't they? Thus, they can impress all their friends, and earn

impressive speaking fees, by making endless prognostications about winners and losers in the Such-and-Such Wars. (Comparisons to Vietnam and Bosnia are in vogue.)

There's no shortage of conflict. The Language Wars. The PC Bus Wars. The RISC/CISC Wars. The API Wars. The OS Wars. The GUI/OOUI Wars. The Client/Server Wars. The Suite Wars. The GroupWare Wars. The Browser Wars. The Object Wars. The Web Server Wars.

Such dramatic language makes great headlines and inspiring rhetoric, but does it reflect reality? Let's look at the so-called OS Wars, or at least its 32-bit campaign. Who won?

OS/2 Warp is here to stay; I've seen no credible evidence to the contrary. The only persistent doubt is the depth of IBM's commitment to supporting and expanding OS/2 beyond the company's traditional customer base. But as an enterprise-wide server and connected client, OS/2's future appears secure.

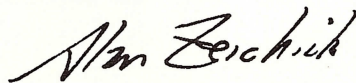
Windows NT, despite the relatively few licenses actually sold, has captured the imagination of many hardware and software vendors, notably including IBM. Although it doesn't have market share, it has mind share; Windows NT is here to stay, too.

Windows 95, overly hyped and riddled with legacy DOS and 16-bit Windows code, is nonetheless an incredible improvement over Windows for Workgroups 3.11. The next version will undoubtedly continue the emphasis on backward compatibility and animated icons, instead of improved performance—but there *will* be a next version.

UNIX is finally shedding its Baskin-Robbins image of a different incompatible flavor for every day of the month. AIX is widely supported, Hewlett-Packard and SCO are working together, and Caldera's Linux package has garnered rave reviews. UNIX doesn't sound like a loser to me, either.

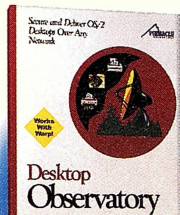
So much for a dramatic conclusion to the Battle of the 32-Bit Bulge; it looks rather like a stalemate. Could it be that there really *wasn't* an OS War after all—that it existed solely in the minds of those industry watchers, journalists, *et al.*? Perhaps we're actually watching the evolution of specialized operating systems, optimized and sold for different purposes, and ultimately able to work together seamlessly in a heterogeneous environment.

Nah. That would make a lousy headline.

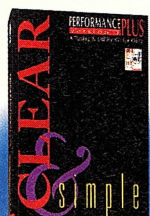


Alan Zeichick
Optimist-in-Chief

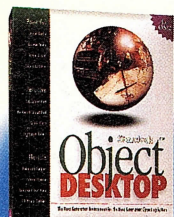




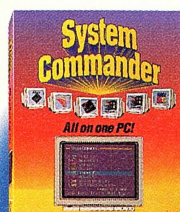
Desktop Observatory™
Create and manage OS/2™ desktops from a server or host. Advanced security features let you monitor application launches, restrict opening and editing of files, and record security triggers to a log file.



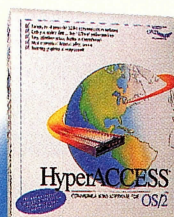
Performance PLUS™ V3
Performance improvements, PLUS utilities you'll use every day. Enhance your OS/2™ system without buying new hardware. Named one of 1995's Best Products by OS/2 Magazine.



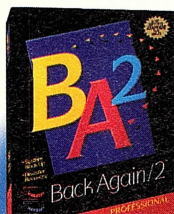
Object Desktop™
The next generation desktop environment. With features such as virtual desktops, viewing files and running programs from ZIP files, resource monitoring, Hypercache, Object Navigator and much more!



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Run both Windows™ 95 & OS/2 Warp™ on one PC! With System Commander you can have any combination of x86 operating systems on your PC.



Hyper Access™
Get online fast with the hottest, most graphical 32-bit communications software around! Setup is effortless. Includes fast file transfers and terminal emulators. Now going online is easier than ever!



BackAgain/2™ Pro
The Ultimate Backup & Recovery for OS/2™ Warp. Includes "drag & drop," unattended operation, and full disaster recovery. Supports virtually all SCSI and ATAPI/IDE tape drives.



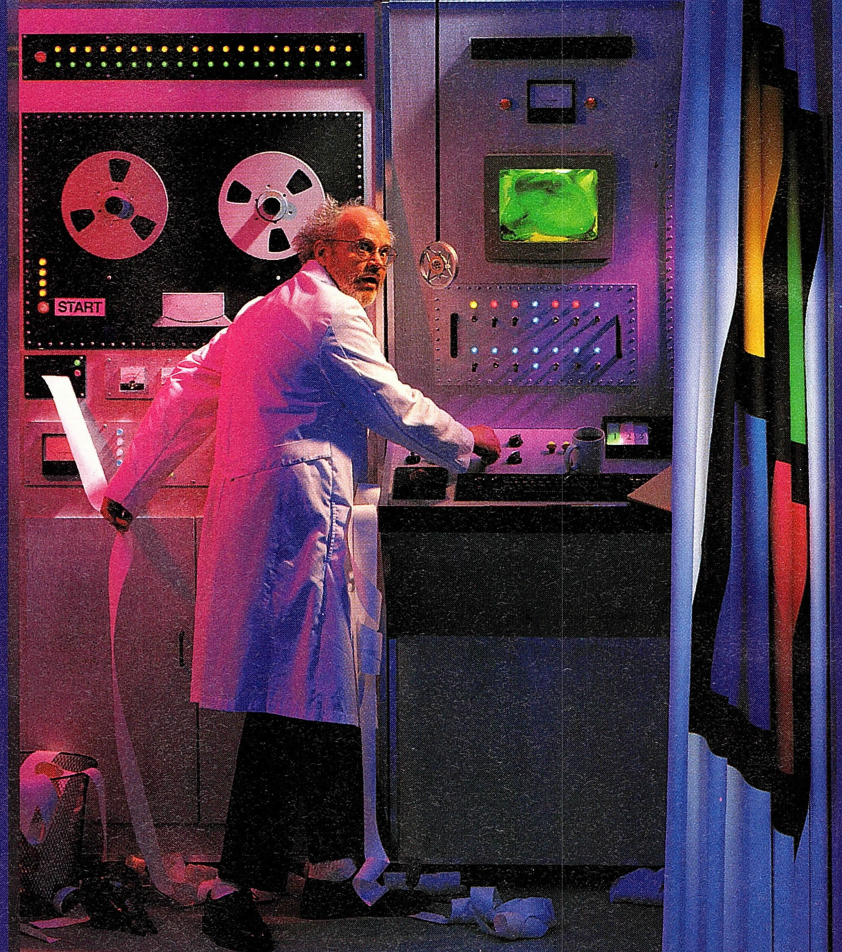
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Pay No Attention To The Operating System Behind The Curtain



You may have heard about a certain famous program that's a completely new, 32-bit "operating system." But one quick look behind the curtain shows it's merely an application running on DOS technology that dates back to the early '80s. If you want a stable 32-bit operating system with true multitasking designed from the ground up to run the next generation of 32-bit software, it's time to move up to OS/2 Warp. Run your DOS, Windows™ and OS/2 software on the OS that runs more PC software than any other. Choose from these featured programs or from the more than 2,000 other OS/2 Warp programs. Don't be led astray on the old yellow brick road – get OS/2 Warp.

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Letters

"Unfortunately, the table on p. 12 got mangled by gremlins."

PentiumPro v. Pentium

Dear Editor:

I appreciate the inclusion of the comparison of the speeds of OS/2 software on Pentium and Pentium Pro PCs ("Dateline: OS/2," February 1996, p. 12), because I'm about to purchase either a Pentium or Pentium Pro PC. However, I am slightly confused about the meaning of the numbers in Table 1.

Also, do you know if IBM plans to rewrite the remaining 16-bit elements of OS/2, as you mentioned in the article, with 32-bit code in future releases?

Howard Schaffer
Metuchen, NJ

Unfortunately the table on p.12 got mangled by gremlins, the correct title is OS/2 performance on a 150Mhz Pentium Pro v. a 133Mhz Pentium. What the table indicated was the speed improvements of running applications on a 150Mhz Pentium Pro over running them on a 133Mhz Pentium. So in this example, the Argonaut Robot runs 88% faster on a Pentium Pro.

As for the amount of 16-bit code inside OS/2, some areas of OS/2, such as device drivers, are definitely 16-bit. But, as it has been explained to me by programmers, both inside and outside of IBM, the remaining 16-bit code has little impact on how well OS/2 performs on most systems. That's not to say that OS/2 won't be totally 32-bit at some future date, but we don't see it happening soon.

-Alexander Antoniadis

Developer note

Dear Editor:

The article "Moving to OOUI," in the January 1996 issue of *OS/2 Magazine* (p. 42), uses a Workplace Shell (WPS) folder to contain database records as objects. This is done by overriding **wpPopulate** and adding the records as **WPTransient** objects.

Overriding **wpPopulate** is a common mistake among WPS programmers (IBM hasn't documented the cor-

rect methods). Any object that wants to be found needs to be available via **wpclsFindObjectFirst/Next**. This method then calls other private methods that implement the find for each base class. Technically, the database records should be implemented as their own base class.

Since it isn't feasible at the present time to write your own base class, developers need to override the current find methods. In this case, the records are implemented as **WPTransient** objects, as they have no persistent data. Instead of adding the objects with an override to **wpPopulate**, **wpclsFindObjectFirst** should be used. The **ClassList** parameter can be checked, and if it's NULL or the **FsWpAccount** object is descended from any class on the list, the objects can be created. You can be more specific by checking the **pszTitle** parameter and only waking up **FsWpAccount** objects that match the title template.

Using the find methods instead of **wpPopulate** will result in better performance. Only the specific classes and titles being searched for will be alerted, and avoiding **wpPopulate** will reduce a lot of system overhead. Remember, each call to **wpPopulate** hits the **.ini** files (to find **WPAbstract**) and the disk (to find **WPFilesystem**). In this case, it will also result in a database query. If **wpclsFindObjectFirst/Next** is used,

with the class and titles narrowly defined, the system will run quicker.

Until recently, **wpclsFindObjectFirst/Next** was less than robust. However, any of the recent fix packs should correct the problems. In fact, these recent fix packs reduce the use of **wpPopulate** calls within the WPS in favor of **wpclsFindObjectFirst/Next**, and have sped up such APIs as **WinCreateObject** by an order of magnitude when working with large folders.

Rick DeBay
Ex-team leader, IBM Workplace Shell

OS/2 e-Zine!

Dear Editor:

I was quite pleased and a little surprised to see OS/2 e-Zine! listed in your "Just Announced OS/2 Internet Sites" section (March, 1996 p. 15). I was pleased for obvious reasons. I was a little surprised because OS/2 e-Zine! had already published four issues at the time it was listed in your magazine. Don't get me wrong, though, it is appreciated.

However, the proper spelling of our publication's title is OS/2 e-Zine!, not OS/2 E-zine as it was listed. In fact if you want to be really accurate, *e-Zine!* should be italicized. No hard feelings though, our title is misspelled on quite a few WWW sites around the Internet so the mistake is understandable.

Also, we have moved to our permanent domain, and the address listed in your March issue is outdated. Perhaps you could provide the updated address for your readers?

Trevor Smith
Editor, OS/2 e-Zine!

We are glad to list any OS/2 information resource, and we have your updated Web page listed in the "Just Announced" section of this issue. However, our house style is to print product names using standard conventional punctuation or capitalization, unless the name is an acronym.

-Alexander Antoniadis

Errata

In March's "Perspectives" (p. 7), we reported the demise of Athena Design Inc., based on information provided by company representatives in late December. Later, we were delighted to learn that Athena Design remains open for business. According to president David Pollak, the company is developing Mesa 2 and the Mesa Developer Object Kit; Athena Design is also working with DeScribe Inc. to sell and market Mesa 2. We regret any panic that our report may have caused.



What if They Gave a Damn and Nobody Came

BY ALEXANDER ANTONIADES

The campaign for OS/2

On February 27, 1996, as the Republican primary swept into Arizona, there was one vigorous campaigner to whom the mainstream media was totally oblivious. John W. Thompson, general manager of IBM's Personal Software Products (PSP) division (home of OS/2), brought his stump speech to the Phoenix OS/2 Society (POSSI).

Fresh from the OS/2 Warp Server launch and San Francisco Bay Area Users' Group meeting, the man responsible for OS/2 is taking his show on the road, telling everyone who'll listen that

IBM is committed to OS/2 and its long-term success. Over the course of this mission, he says, three questions always pop up.

The first question: "How committed is IBM to OS/2?" His answer is an emphatic "Very!" The crux of his argument, which we've heard consistently since he took charge, rests on the importance of OS/2 to IBM's own development and the investments made by Fortune 500 customers. Mr. Thompson touts the party line that IBM CEO, Lou Gerstner, doesn't have to talk about OS/2 because it's PSP's product to win or lose.

Mr. Thompson concedes that OS/2 will no longer take on Windows 95 head-to-head, and that large-scale assaults, such as the OS/2 Warp TV campaign, aren't cost-effective. Instead, he plans to focus on two fronts: the server market for OS/2 Warp Server and something he calls the "connected consumer" with OS/2 Warp Connect. It's hard to decipher exactly who these "connected consumers" are and what marketing efforts will be made to attract them, but it's safe to say that the consumer game push and "the totally cool way to run your computer" ads are a thing of the past.

The second question asks: "Will OS/2 ever run Windows 95 programs the way it runs Windows 3.1 programs?" The response: He has a team of 15 programmers determining if it can be done, how it can be done, and how well it can be done. According to Mr. Thompson, handling general Windows 95 function calls under OS/2 isn't too difficult, but resolving all of the OLE protocols could be problematic. Given that caveat, he stated that implementing total Windows 95 emulation was not likely to be PSP's goal, but instead we might see limited Windows 95 compatibility on an application-by-application basis, with Microsoft Office 95 being a top priority.

Finally, the third question is "What's the deal with Lotus?" which is referring to the IBM subsidiary's out-of-date offerings for OS/2. Mr. Thompson responded that everything takes time, but the native OS/2 versions of WordPro (the successor to AmiPro) and Freelance Graphics should either be in a wide beta or even a full release by the

OS/2 APPLICATIONS TOP 15 LIST—FEBRUARY 1996

This Month's Rank	Last Month's Rank	Product	Company
1	2	Partition Magic Personal Edition	PowerQuest
2	1	Object Desktop	Stardock Systems
3	6	Describe Voyager CD	Describe
4	4	BackMaster 2.0	MSR Development
5	-	System Commander 2.2	V Communications
6	11	IBM Antivirus	IBM
7	8	Unimaint 4.0	SoftTouch Systems
8	5	Hobbes CD-ROM Archive	Walnut Creek
9	12	GammaTech Utilities 3.0	SoftTouch Systems
10	9	Galactic Civilizations 2.0	Stardock Systems
11	13	BackAgain/2 Professional	Computer Data Strategies
12	-	DeskMan/2 1.51a (Corp. Ed.)	Development Technologies
13	-	Performance Plus 3.0	Clear and Simple
14	-	KopyKat 1.2	Hilgraeve
15	9	FaxWorks Pro 2.0 Upgrade	SoftNet

Since OS/2 Warp and OS/2 Warp Connect are consistently ranked as top-selling products, and sales of additional licenses can sometimes skew results, this list has been modified to highlight only the top-selling OS/2 applications. (Best-seller information courtesy of Indelible Blue.)

Dateline: OS/2, cont'd on p. 12

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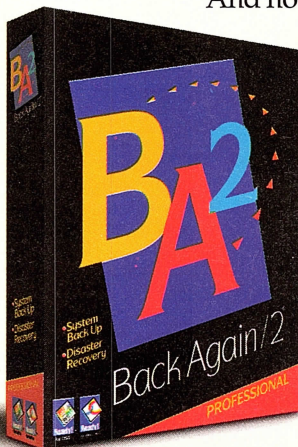
If you've ever had that sinking feeling ... caused by sudden data loss, you'll really appreciate Back Again/2¹ Professional, the ultimate backup and recovery for OS/2² Warp. Back Again/2 protects your data from errors – computer, or human.

BA/2 takes full advantage of OS/2 Warp, including IBM Workplace Shell "drag and drop" support, dynamic compression adjustment, and full 32-bit operation. Get control of your life with up to 48 scheduled backups when you want, as often as you want, and

without a separate utility. And no need to panic if your system crashes while you're under a tight

deadline. With its stand-alone restore facility, BA/2 eliminates having to reinstall OS/2. You're up and running in minutes! BA/2 makes backing up to SCSI tape drives, networks, removable cartridges, and even floppy disks as easy as "drag and drop."

And now with even broader device support, including fast and economical ATAPI/IDE tape drives like the APS HyperQIC³ and the Conner Tape•Stor 4000⁴, there's no reason to lose even one bit of data. So don't be stubborn about backing it up. Get BA/2 – it's a real lifesaver! For more information, see your local reseller or call CDS at 1-800-284-4156.



System requirements: IBM OS/2 2.1 or greater, and support for most SCSI tape drives

¹BackAgain/2- Copyright CDS, Inc.

²OS/2 is a trademark of IBM

³APS Technologies 1-800-233-7550

⁴Conner 1-800-4- Conner

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computer data strategies

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Ready for
OS/2 WARP
LAN Server

It's Never too Late - With Back Again/2.

Dateline: OS/2, cont'd from p. 10

time you read this column; the full SmartSuite 96 (including Organizer and Approach) will be available for OS/2 by the third quarter of this year.

Mr. Thompson also addressed why the IBM PC Co. doesn't preload OS/2 on all its machines. The reason, according to him, is that the PC Co.'s channel partners (the outlets IBM sells through), thought that OS/2 wasn't worth supporting, especially on consumer models like the Aptiva. Therefore, the PC Co. agreed not to include the disk images necessary for preloading.

While he said that things are better with the IBM PC Co., along with other computer makers, most of the audience seemed to feel that things on the OEM front couldn't get much worse. Thorny issues, such as OS/2 preloads, take the impact out of Mr. Thompson's otherwise perfect presentation and go straight to the heart of OS/2's dilemma.

Good things have always been on the horizon for OS/2 users, and while some of these things have come

about, many of them haven't. Adobe announced and demonstrated FrameMaker for OS/2 at Fall COMDEX, only to unexpectedly drop the product shortly before it entered beta in early March. At around the same time, Sony's Psynopsis division decided not to release the OS/2 version of the Lemmings game, even though it was one of the products announced in conjunction with the release of OS/2 Warp.

To the OS/2 community, big software companies are often ships that pass in the night; so many of us have come to view them, and their promises, with some skepticism. While we personally believe in the sincerity of John W. Thompson, time will be the true test of his employer's commitment.

QuickTime for OS/2

When IBM announced its intention to port Apple's QuickTime to OS/2 and have it available by early 1997, our reaction was one of confusion. Like most people, we think of QuickTime as being only the QuickTime .mov file format

that stores and plays video on computers. So, how could it take IBM nearly a year to bring QuickTime to OS/2 when Andreas Portele, a self-described "poor and hungry student," could write a shareware add-on for OS/2, called AnPoCODEC, that runs similar Video for Windows .avi files under OS/2?

According to Martin Guttman, who is the multimedia technical planner at IBM, it's because QuickTime for OS/2 will be the whole QuickTime API—not simple video playback. The QuickTime API extends into other areas, such as QuickTime VR, which is a quasi-three-dimensional video playback mechanism, and QuickTime Audio, for reading the new CD-Audio music CDs that contain both computer data and music.

While no one is promising that all of the QuickTime products will be in OS/2, the new API set should make it easier for developers to make more multimedia titles available under OS/2. For more information about QuickTime, go to Apple's QuickTime Web page at <http://quicktime.apple.com/OS2/>

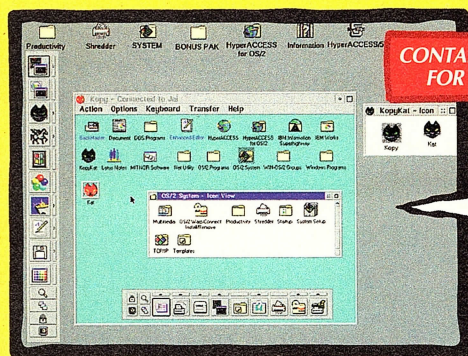
KopyKat[®]

REMOTE CONTROL SOFTWARE FOR OS/2



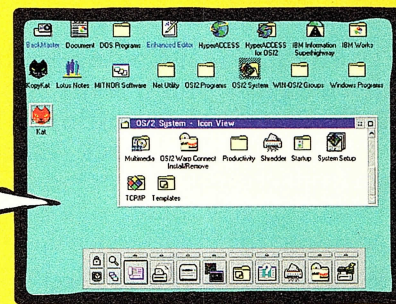
KopyKat is the best remote control solution for OS/2.

KopyKat gives you convenient, reliable graphical remote control between PCs with OS/2 1.3, 2x, or Warp through modems, serial cables, local or wide area networks, or the Internet. Our hot compression technology, together with built-in support for hundreds of modems and networks make KopyKat a fast, powerful solution for OS/2 remote control.



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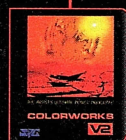
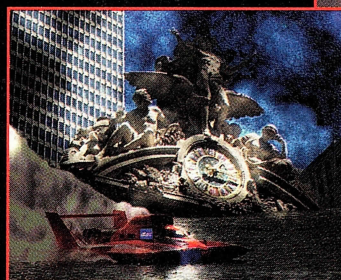


ColorWorks is a professional quality, high level image-processing program with more features and customizing options than any three other programs" *S/2 Magazine*

Out Photoshops Photoshop. It just might be the system-stifling application or the next "killer application" the world has been waiting for." *Andrew Seybold's Outlook*

The most exciting thing about ColorWorks is its wide open image editing architecture and unconventional approach. *S/2 Professional Magazine*

ColorWorks is an impressive product... Its power is immense, and there are few, if any, limits to the artist's imagination." *our Computer*



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Just Announced

New products for
the OS/2 community

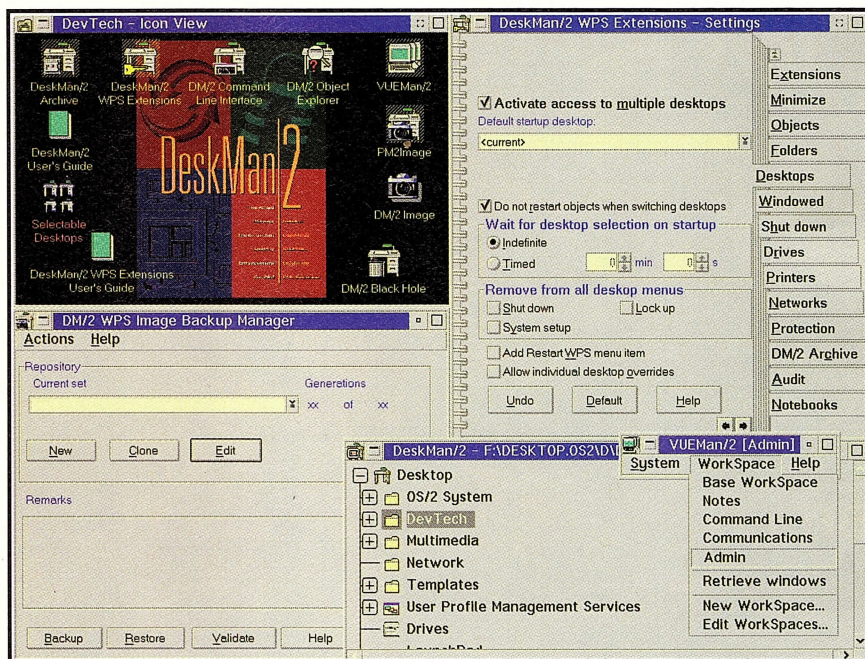
DeskMan/2 2.0

Desktop management update

Development Technologies releases the next version of its OS/2 Desktop management utility. New in DeskMan/2 2.0 is the ability to manage multiple desktops, which can be chosen at startup through DeskMan/2's MultiDesk Personal Desktop facility. Additionally, any number of workplaces, which are customized work environments similar to virtual desktops, can be set up for a single machine. Other new features include continuous Workplace Shell backup, live desktop synchronization, and context sensitive tools. DeskMan/2 is priced at \$99.95, upgrades from 1.x are available for \$24.95.

Development Technologies, (803) 790-9230, fax (803) 738-0218, or e-mail 71333.3362@compuserve.com.

READER SERVICE NO. 100



GammaTech IRC 2.0

Updated IRC program

SoftTouch Systems announces the update to its graphical client for the Internet's Relay Chat (IRC) protocol. GammaTech IRC 2.0 features added CTCP Sound support to send and play .wav files. This program also offers a new On Message dialog with the ability to perform several user-defined actions that are based on "trigger text," including beeping your system, playing a multimedia .wav file, or sending a file or private text message to the requesting client. Other enhancements include: the CTCP flood protection that permits users to ignore CTCP flooders, a /RAW command that sends supplied text directly to the server, and a new option to rejoin channels after a disconnect. GammaTech IRC 2.0 is priced at \$49.95; the introductory price is \$39.95. 1.0 users can upgrade for \$19.95.

SoftTouch Systems, (405) 947-8085, fax (405) 632-6537, e-mail webmaster@softtouch.com, or see its Web page at <http://www.softtouch.com>.

READER SERVICE NO. 101

APS OS/2 Catalog

New mail-order catalog of OS/2 offerings

APS Technologies is releasing a new 56-page catalog that lists hardware and software products made for OS/2 users. The premiere issue of this catalog will feature a selection of hardware that includes hard drives, tape drives, CD-ROM drives, SCSI cards, CD-R and MagnetoOptical drives, as well as printers, scanners, and UPSes. Software selections include OS/2 applications, utilities, and games.

APS Technologies, (800) 233-6525, (816) 432-1600, or (816) 483-3077, e-mail sales@apstech.com, or see its Web

page at <http://www.apstech.com/>.

READER SERVICE NO. 102

pLog 1.0

Call/fax tracing contact manager

Oberon Software has created a new contact management package for OS/2. pLog helps track incoming and outgoing calls, and it integrates with existing FaxWorks databases. Features include: built-in speed dialing, scheduling for callbacks, report generation, and LAN support for accessing corporate FaxWorks databases. pLog is priced at \$35.

Oberon Software, (507) 388-7001, fax (507) 388-7568, BBS (507) 388-1154, e-mail oberon@prairie.lakes.com, or see its Web page at <http://prairie.lakes.com/~oberon>.

READER SERVICE NO. 103

Just Announced, cont'd on p. 16



[IS THIS HOW DATA FLOWS IN AND OUT OF YOUR NETWORK?]



Just Announced

Just Announced, cont'd from p. 14

iLink/2 1.0

Replacement dialer for the Internet Access Kit

Mental Static Software is announcing replacement for IBM's Dial Other Provider, which is included with OS/2 and used by the Internet Access Kit. iLink/2 features built-in redialing, multiple number support, command line autodial, autostarting programs on connect, and automatic reconnection. iLink/2 is available for \$25.

Mental Static Software, e-mail cpommer@georgian.net or via the WWW at

<http://www.georgian.net/~cpommer/os2projects.html>. Otherwise contact BMT Micro at (910) 791-7052.

READER SERVICE NO. 104

ViaFax/2 1.1.4

OS/2 fax solution

Standik & Co. announces a new version of its fax processing program for OS/2. ViaFax/2 now supports OS/2 Warp, although it can still run on a regular OS/2 machine. This program enables faxing from workstations and hosts, as well as providing document storage capabilities for fax-on-demand applications. New features include

automatic fax recovery in case of system power outages, better image creation functions, and HTML-to-fax processing. Pricing for ViaFax/2 starts at \$4,995.

Standik & Co., (603) 547-2000, fax (603) 547-2699, or via e-mail at standik@ibm.net.

READER SERVICE NO. 105

RhinoCom Server 1.5

Communications server for OS/2

Rhintek is announcing the release of a new communications server for OS/2. RhinoCom Server allows modem pooling, bulletin board services, fax send/receive, Internet access, modem conferencing, and automatic call logging. This program is based on the same communications engine that runs on RhinoCom's other terminal programs. Pricing for RhinoCom Server starts at \$5,000.

Rhintek Inc., (800) 234-4546, (410) 730-2575, fax (410) 730-5960, BBS (301) 596-5618, or see its Web page at <http://www.rhintek.com/rhintek>.

READER SERVICE NO. 106

VisPro Reports 2.0

Updated database designer

Hockware releases a new version of its database design tool for OS/2. New in VisPro/Reports 2.0 is support for IBM DB2, Watcom SQL, ODBC-enabled databases, as well as REXX and C interfaces. The VisPro Database Designer is now the same Entity/Relationship diagramming tool found in Hockware's other VisPro products. The VisPro/Reports Preview window allows users to view report queries as the report is being designed. Reports can now be viewed or exported to various file formats including BMP, MET, and ASCII text.

The suggested retail price for VisPro/Reports 2.0 is \$199; upgrades from version 1.0 are priced at \$79.

Hockware Inc., (919) 380-0616, fax (919) 380-0757, e-mail hockware@

Just Announced, cont'd on p. 18

Just Announced OS/2 Internet Sites

Central Site for OS/2 Updates

<http://www.cincyteamos2.org/masterupdate.html>

A wonderful site of free updates to IBM products: OS/2 Warp, OS/2 Warp Connect, BonusPak apps, TCP/IP, and Lan Distance can all be found in one central location.

OS/2 Warp Server Home Page

<http://www.austin.ibm.com/psinfo/warpserver.html>

All the information about OS/2 Warp Server you'd ever want to know. Be sure to check out the new layout and graphics used on this page. Other pages should be getting a similar look and feel soon.

IBM PC Co. OS/2 Files and Assistance

<http://www.pc.ibm.com/files.html>

A wealth of information from the 'Assistant' series of .inf files about OS/2 to CSDs. It also contains every driver available for OS/2 and IBM Personal Computers. A must site for your Quicklist.

OS/2 E-mail Campaign Page

<http://www.andrews.edu/~boyko/email.html>

Helping petition Windows developers to support OS/2 has never been easier.

The Highly Unofficial IBM OS/2 Beta FAQ

http://www.students.uiuc.edu/~kwilas/faq_top.html

This page tries to answer questions that repeatedly crop up on the OS/2-related Usenet news groups.

Toma's OS/2 Game Page

<http://www.liberty.com/home/toma/os2games.html>

A Web page offering listings and backgrounders on various OS/2 game projects.

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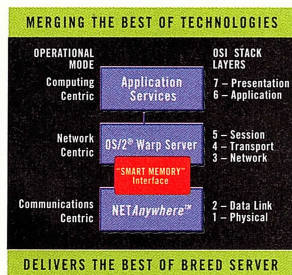
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(Information courtesy of Vicci Conway, vicci@ibm.net.)

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com, or see its World Wide Web page
at <http://www.hockware.com/hockware>.
READER SERVICE NO. 107

Livewire 3.2

Updated graphical terminal program

DataMirage Software is releasing a new version of its Workplace Shell terminal package. Livewire 3.2 has a multithreaded user interface that can handle multiple online sessions at the same time. Other enhancements include logs for analyzing phone charges, TCP/IP support, customizable buttonbars and toolbars, and REXX scripting. Livewire 3.2 has a retail price of \$73, upgrades from 3.0 are free.

DataMirage Software, (206) 521-9663, BBS (206) 521-9664, e-mail les@datamirage.com, or see its Web page at <http://www.datamirage.com>.

READER SERVICE NO. 108

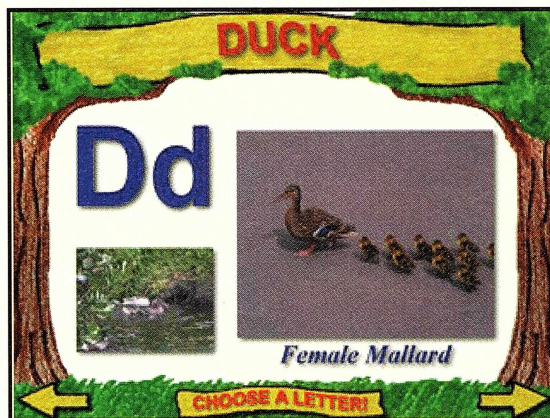
Alphabet Zoo 1.0

Edutainment for OS/2

Second Story Production is simultaneously releasing OS/2 and Windows 3.1 versions of a new edutainment product. Alphabet Zoo helps children learn about both animals and the alphabet. The program shows pictures and videos of animals, along with the first letter of the animal's name. Additionally, games are included to help children retain and use their new knowledge. This program comes on CD-ROM and has both 8- and 24-bit graphics, as well as speech and sound. Alphabet Zoo is available for \$44.95.

Second Story Productions, (414) 673-9951, fax (414) 673-9961, or e-mail mike.2sp@ix.netcom.com.

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New Features and Enablement for Old Ones

BY DAVID REICH

TIP 228:

SAME OR SEPARATE?

Q: I'm unable to start Microsoft Excel as a separate session, or any other application for that matter. My Win-OS/2 is set for Fastload and 3.1 Enhanced. I have the Program Manager in the Startup folder set at 3.1 Enhanced. I've tried different combinations of the above, but without success. What am I doing wrong?

A: As you know, you can run different Windows applications under OS/2 in one single Virtual Dos Machine (VDM) session, each in its own session, or some combination of the two. Running in a separate session applies to either running an application as a Win-OS/2 window on the OS/2 desktop (seamless) or starting separate Win-OS/2 full-screen sessions and running the different applications in them.

When you run a Win-OS/2 full-screen session, you're starting the Program Manager in its own session. All applications started from the Program Manager in a full-screen session will run in that single session.

If you run Win-OS/2 applications in Win-OS/2 (seamless) windows, then you have the choice, in the program reference object that starts the application, to have it in a separate session or to run in the same session as other Windows programs. This selection is

on the Session page of the Settings Notebook, which includes a checkbox for **Separate Session**. When this box is checked, the application will be started in its own session. Otherwise it's started in a common seamless Windows session.

If you want to run Windows applications from the Program Manager in full-screen sessions, but have separate sessions as well, start different Win-OS/2 full-screen sessions and run the different applications in each.

Be aware that each separate Win-OS/2 session loads a separate copy of Win-OS/2. This uses up memory, because they are separate copies of the code. When running this way, you will use more memory than just having all of the applications in the same session.

The advantage to separate sessions are that they prevent programs from fighting or they allow you to multitask the programs with each other.

TIP 229:

DYNAMIC DRAGGING

Q: I heard a rumor that when dragging windows you can have an image of the window drag as opposed to just the outline of the window. Unfortunately, I haven't been able to figure out how to make this change.

A: Well, part of the reason you can't figure it out is that it went into OS/2 Warp coincidental with the System Input Queue changes in FixPak 17

(April 1996, Tip 227, "The System Input Queue," p.19). If you have FixPak 17 or later, you can enable full-window drag by adding a line to your *config.sys* and then rebooting. The line you need to add is:

```
SET PM_DYNAMIC_DRAG = ON
```

Now reboot your system. It's important to reboot the system because this setting is only read at boot time. This function is turned off by default and must be enabled explicitly. To re-disable the function, remove the line from *config.sys* and reboot.

You should know that this function does not work on Win-OS/2 windows in this release.

TIP 230:

MULTIPROCESS APPLICATION

Q: I'm using the IBM Class Libraries (ICLUI) and DB2/2 to write an application that allows users to copy data from one to another DB2/2 database. This data could be anywhere from a single record to thousands of rows that involve a multitude of different table structures. I currently have it set up so that my main process gathers the user options, as well as the database names. This process then kicks off two subprocesses: one connecting to the target database and the other connecting to the source database. I was thinking of using named pipes/semaphores to control the



OS/2 2.1 Calculator

Thanks to Mr. James Reach, who responded to Tip 198, "Calculated Risks" (January 1996, p.17), with his trials and tribulations in restoring all of the OS/2 2.1 calculator files from the bundles. Here are the steps he followed to get the calculator up and running:

The relevant files are on the bundle called **disk_14**.

To unpack the relevant files, the target directory commands in unpack don't work. According to help, the command should be

```
UNPACK F:\CALC DISK_14 /N:PMDCALC.EXE
```

if *f:\calc* is the target drive and directory. However, the target drive and directory don't work when using the */n:filename* parameter of unpack. The entire bundle must be unpacked and the unneeded files subsequently deleted.

Use this command

```
UNPACK F:\CALC DISK_14
```

to unpack the entire disk bundle into *f:\calc*. You can then proceed to delete the unneeded files.

With respect to starting one process within a separate second process from a third, you have several methods at your disposal. First, you need to signal the target process to kick off another. If you're using DDE, you can make this signal with a special DDE data packet. You could also create a semaphore communication mechanism to trigger an event in one process from another. A good example would be an Event Semaphore.

Once the target process is told to start its new task, you can use **DosCreateThread** to create a new thread within the process, **DosExecPgm** to start a new program within the same session (a new process), or **DosStartSession** to start an entirely new session.

TIP 231:

DRIVE MAP

Q: I have both FAT and HPFS partitions on my OS/2 Warp machine. However, when booting to DOS, all my drives get remapped and I'm unable to access my data on the HPFS drives. In dual-boot I added this line to *config.sys*:

communication between the two processes. I have little experience in interprocess communications and was wondering if this approach is the best. An acknowledgment of the success or failure would also be required and should be sent back by way of the sending process to update the target database. Would these pipes be set up in the main process or in each of the subprocesses? Am I on the right track?

Also, once the user selects "OK" and starts the copy in a subprocess, some validation of selections needs to take place in the other process. How do I kick off a function in a process from a different process?

A: After exchanging some e-mail with this programmer, I understand why my first suggestion of using multiple threads in a single process is not feasible. The reason is that DB2/2 doesn't allow multiple connections to a database from within a single process. This fact necessitates a multiple-process approach.

In this instance, pipes are a viable option, but then you have the overhead of semaphores and the concern of having to track whether the pipe is full when you're trying to write or empty when you're trying to read. The same overhead applies to using queues for the data structure.

An excellent choice for this function is Dynamic Data Exchange (DDE).

DDE works like a packetized pipe and handles all of the coordination for you through messages. DDE is a protocol and a set of messages through the Presentation Manager graphical subsystems of OS/2 that facilitates communication between processes. Using DDE, you can coordinate the passing of data and acknowledgements of receipt, without writing code to handle semaphores and data structures directly.

Undelete Update

Referring to Tip 206, "Deleting Undelete," (January 1996, p. 20), I received some mail from Joseph Kessleman about some other **UNDELETE** options.

It's possible to selectively delete files permanently, so that they aren't recoverable through the **UNDELETE** command. To accomplish this action, when you delete the file, rather than just using the **DEL** command, you can use **DEL filename.ext /F**.

Additionally, it's possible to control the delete behavior in individual sessions. The **DELDIR** statement in *config.sys* is an environment variable that's used on a per-session basis. Unlike **PM_DYNAMIC_DRAG**, which is only accessed once at boot time, **DELDIR** is used by the **DEL** command in each session. As such, you can tailor the undelete behavior per session.

If you have previously removed the **REM** from the **DELDIR** statement in *config.sys*, undelete is enabled across the system. To change this setting, turn it off for each session. If you have left the **REM** in *config.sys*, turn it on for each session you want it in. This change overrides it from the global system setting in *config.sys*.

To override the setting, enter a **SET** statement similar to the one in *config.sys*. For example, to disable undelete in a session, go to a command prompt session and type "SET DELDIR=". This line effectively wipes out the **DELDIR** environment variable for that session and disables undelete. To enable undelete, type: "SET DELDIR=C:\DELETE,512;" (or whatever drive you wish).

Note, if the program you want to run in the session is a graphical program, it behaves according to the Presentation Manager session, so it's whatever is in *config.sys*. Overriding is really only effective for OS/2 Command-Prompt sessions.

Tips & Tricks

DEVICEHIGH=C:\os2\mdos\fsfilter.sys

In *autoexec.bat*, I added the line:

c:\os2\mdos\fsaccess.exe

As you might have guessed, nothing happened. Can you tell me the correct way to use these commands? By the way, I didn't seem to get anywhere with the switches on *fsaccess.exe*.

A: Unfortunately, all the switches in the world aren't going to help on this one. Out of the box, HPFS drives can't be mounted (set up for file system access) under DOS.

Some shareware programs can do the trick. One is called AMOS. AMOS can be found on the Internet at hobbes.nmsu.edu.

The *fsaccess.exe* program and *fsfilter.sys* device driver allow access to HPFS drives when you use a specific version of DOS booted under OS/2. You might know it as DOS from Drive A.

When you run DOS programs under OS/2 in a VDM, the OS/2 file system handles access to HPFS drives

for the application, because all file system calls (even from DOS applications) go through the OS/2 file system. When you boot DOS from drive *a:* or a DOS-bootable image, some special tools are needed to access HPFS drives. Although you are still running under OS/2, file system access is a bit different, and this area is where FSACCESS and FSFILTER come into play.

When booted under DOS, you don't have the benefit of the OS/2 file system underneath to help you mount and manage HPFS drives. The AMOS tool allows HPFS access under DOS, but FSFILTER and FSACCESS only work on a DOS image booted under OS/2.

that some programs generate this type of file, but you don't actually tell us what format to use. If I want to save a graphic to use as a boot logo, what file format do I select?

A: The file format for the OS/2 boot logo is not a standard graphics file format. A program by Jon Czerwinski, called PrepLogo, takes an OS/2 bitmap (BMP) file and produces an OS/2 Warp boot logo format file. You can take this new boot logo file, and after removing the attributes on the *os2logo* file, copy it over to become your new boot logo.

You can find PrepLogo at hobbes.nmsu.edu in the *os2/warp/sysutils* directory as *plogo100.zip*. **OS/2**

TIP 232:

BOOT LOGO

Q: In Tip 207, "New Logos," (January 1996, p. 20), you stated that, "The file format used by the OS/2 Warp 3.0 boot logo code is not quite the same as a bitmap file." You go on to say

David Reich has been with the OS/2 development team since 1987. David is a contributing editor and has written numerous articles on OS/2. He is the author of *Designing High-Performance OS/2 Warp Applications* published by John Wiley and Sons. Questions can be addressed to David via CompuServe at 76711,632 and via the Internet at speedracer@austin.ibm.com.

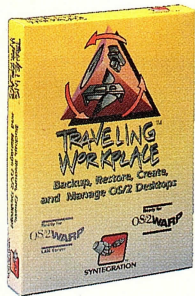
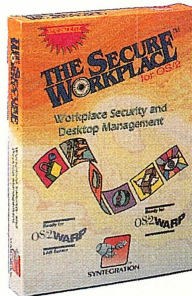
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Reader Service No. 14

Crash Protecting OS/2

Making IBM's claims about OS/2's stability come closer to reality.

By David P. Both

IBM tells us that "OS/2 is crash protected." Some zealots would even say that OS/2 Warp is crash-proof. Though I am an OS/2 zealot, I was also the lead OS/2 support person for the IBM PC Co. for many years, so, I won't say that OS/2 is crash-proof. I've seen too many cases in which systems running OS/2 have crashed to agree with that claim. However, let's examine the statement that OS/2 is crash protected, see from where that assertion comes, and examine the truth of the matter. While we're at it, let's look at some of the more common causes of crashes on OS/2 systems and how they can be prevented or minimized.

IBM began talking about OS/2's crash protection in early 1992, while OS/2 2.0 was in beta testing. IBM states on the OS/2 Warp package that "Crash Protection™ helps prevent a single wayward program from affecting the rest of your system." Notice that the term "Crash Protection" is an IBM trademark. If it's so important, and OS/2 has it, then why does OS/2 still crash?

Let's crash an application

Applications can and do crash. In many cases, the problem is some type of programming error. The short C++ program in Listing 1 is an example of a program that can crash under certain circumstances. This program is designed to request a name as input. The variable **Name** is defined as a three-character string. The program will cause an access violation and **SYS3175** error if you enter a name with more than three characters. Thus, it will fail for long names and not fail for short ones. The **SYS3175** error message is displayed in a Presentation Manager dialog box. **SYS3170**, **SYS3171**, or **SYS1808** errors are also possible, depending upon the length of the name entered.

In the case of a three-letter name, such as Don, the program displays a text line that says, "The name you entered is: Don." No error occurs. With a four-letter name, such as Dave, the program crashes and OS/2 displays a dialog box, which says that a **SYS3171** error has occurred. If you view the register display from the dialog box

choices, the error detail will be exception **c0000005... insufficient stack space**.

Now run the program and enter a 15-letter name. The program crashes again and displays a dialog box that says that a **SYS3175** error has occurred. The register display shows that the error is an **...access violation...** This program has also generated a **SYS3186** error, which is a privileged instruction error when used with, for example, the name Jennifer.

In all cases, when the error occurs the program crashes. Of course, OS/2 itself hasn't crashed, and the other applications running on the system continue as if nothing has happened. As far as the other programs running on your system are concerned, nothing has happened because they were protected from the crash of the defective program. This is what IBM means by crash protection, and OS/2 fulfills this promise quite nicely. (This program would also crash in a DOS or Windows environment, but the entire system would crash and recovery would usually necessitate rebooting the system.)

Some interesting conclusions can be drawn from this little experiment. The first is that a single bug in a program can cause a number of different symptoms. In this example, at least five different errors are present.

Second, a bug might not necessarily present itself and cause a symptom, at least not until the proper circumstances are present. This situation can occur in a real program in which a programmer didn't fully consider the size of a data field. In an accounting application, we may have defined this name field as 20 characters long. It can also work fine for years until a new employee, with a very long name, is hired.

Listing 1: This C++ program can crash under the right circumstances.

```
#include <iostream.h>

void main()
{
    char Name[3];

    cout << endl << "Enter a name: ";
    cin >> Name;
    cout << endl << "The name you entered is: " << Name << "." << endl;
}
```


An error occurs while entering the new employee into the payroll program. The payroll clerk then calls the company support person with this new bug. In many cases, the assumption is that the program is still fine, but the hardware is at fault or that OS/2, which was installed last week, is now the problem.

Application lockups

OS/2's multitasking uses a priority-based round-robin, preemptive algorithm. Basically, OS/2 gives the CPU to the task with the highest priority; if another task is running at a lower priority, it will be preempted by OS/2. OS/2 will not allow a lower-priority task to run until the higher-priority task has completed.

A poorly written OS/2 application can take up all the CPU time and cause the entire system to lock up. Listing 2 contains a C program that operates entirely within the rules of OS/2 and its programming APIs, but will lock up the system as soon as it begins to run. This program boosts itself to the highest priority in the system and loops in a math operation, which prevents OS/2 from allowing any other application CPU time.

Occasionally, a program can enter a high-priority section of code and get stuck there, causing a complete system lockup. Other times, the program will stay in the high-priority section for several seconds or even minutes. This is not good programming, but it happens. Waiting a few moments will bring the system back to normal when the program that causes the problem reduces its priority back to normal or completes its execution of the high-priority thread. By the way, code can be written that causes any operating system to lock up or crash.

The Single Input Queue

Another cause of OS/2 crashes is the Workplace Shell's single input queue (SIQ) design. SIQ simply means that all of the mouse inputs and keystrokes, sent to the Workplace Shell, are put in a single queue to wait to be processed by the application for which they were intended. So, an application that was not written to properly respond to the queue and release it immediately can cause the entire desktop to lock up. Memory overcommitment of 100% (when total system memory requirements are 200% of installed RAM memory) or more also seems to contribute to the SIQ lockup problem.

In reality, OS/2 is not locked up; only the desktop is frozen. Other applications continue to run, so if you have a print job spooling or a download from a BBS in process, those tasks continue. You can see this in action if you start the OS/2 System Clock and configure it to show the seconds hand. If your system locks because of the single input queue, you have the luxury of waiting until the critical application or download have completed processing, or until the blockage clears itself, before rebooting the system to regain control of the desktop.

The SIQ was designed into OS/2 by Microsoft back in the

days of OS/2 1.1, the first version to have the Presentation Manager desktop environment. This design came about because—so the story goes—the programmer responsible for the Presentation Manager didn't know how to deal with multiple input queues. With multiple input queues, each application has a separate queue for mouse and keyboard activity, so a single misbehaved application doesn't lock up the entire WPS. Microsoft has used a multiple input queue strategy in Windows NT and Windows 95 to overcome this problem.

IBM hasn't modified OS/2 to provide multiple input queues because, they contend, that would break existing OS/2 applications that depend upon the SIQ model. IBM has said, however, that they intend to fix this problem and appear to have included the circumvention in FixPak 17 (See "Dateline: OS/2," April 1996, p. 11). The fix is not multiple queues, but rather a watchdog timer on the SIQ, which releases the queue automatically when one application refuses to respond. (FixPak 16 supposedly included the SIQ fix but has been withdrawn due to some problems. If you have a copy of it, don't install it.)

A great deal of controversy exists over whether this approach to the solution results in a true remedy or merely a workaround. If it works, though, it works! FixPak 17 does contain the SIQ fix. It's described in the text file *read17_1.txt*, included in FixPak 17. The following line must be added to the *config.sys* file to activate the fix.

```
SET PM_ASYNC_FOCUS_CHANGE=ON x
```

The *x* parameter specifies, in milliseconds, the amount of time that OS/2 waits before determining that the application is not responding. The default with no parameter is 2,000 milliseconds (two seconds). The suggested range is from two to five seconds. Once it has determined that a program is not responding to the queue, OS/2 flags the queue as bad and switches to the next application.

OS/2 continues to monitor the queue to see whether the application begins to respond by reading messages. If this occurs, OS/2 marks the queue as good and continues to operate normally. If the application doesn't respond to the queue, you can try to terminate the program or just ignore it.

Hang and lockup recovery

Once you realize a lockup has occurred, spend a moment observing what is actually happening before taking any action. Some apparent lockups are caused by normal activities, such as disk swapping. When launching a program with memory already overcommitted, a large amount of swapper activity occurs. Because this activity takes priority over all else, except communications, the system might appear to come to a halt. Heavy disk activity can indicate that the sys-

**"Crash
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OS/2 has it, then
why does OS/2
still crash?**

Crash Protection

tem is engaged in serious swapping, rather than being locked up.

We do have a couple ways of recovering from OS/2 system hangs and lockups that are caused by the software problems discussed earlier. First, press the <Ctrl+Esc> key combination repeatedly. This action will normally result in a dialog box that prompts you to terminate the application without rebooting. Be sure to wait for several minutes before proceeding with any drastic actions, because OS/2 can take a long time to respond to <Ctrl+Esc>. How long? Ten or 15 minutes wouldn't be unreasonable for a slow (less than 33MHz 486) system; five or six minutes would be appropriate for faster computers. Incidentally, OS/2 Warp's response to <Ctrl+Esc> seems much faster with FixPak 17.

Another solution is to install WatchCat. It's a utility program written by a pair of programmers in Germany, and it helps recovery from some OS/2 lockup situations. When a system with WatchCat installed locks up, you can generate a wake-up signal using one of several methods, such as a selected keyboard combination or mouse or joystick input. Once WatchCat is asked to take control, it allows you to terminate the locked applica-

tion. Some types of applications, however, by their nature, can't be terminated. The registered version can terminate more applications more brutally and has more activation methods along with other features.

WatchCat is intended to kill programs that aren't responding to input by freeing the input queue. It seems to do a good job. WatchCat can't, however, help with programs that hog the CPU by running at high priority. The program in Listing 2, for example, can't be terminated because poor WatchCat can't get any CPU cycles! I also found it necessary to use the key combinations several times to get WatchCat's attention. The documentation suggests an alternative activation method when this occurs.

If you can't terminate the locked program, you can reboot using <Ctrl+Alt+Del>. This soft reboot will be intercepted by the OS/2 kernel and flush the cache and buffers to disk before terminating OS/2 and rebooting. It's not the best solution, but at least all files will be closed properly.

If a soft reboot doesn't work, the chances are very high that you don't have a software problem but rather a hardware problem, such as a lost interrupt. You can also tell when the system

has entered a "hard lock," because the OS/2 system clock's second hand will stop. Hardware causes of OS/2 crashes are discussed in following sections. When other attempts at recovery don't work, you will have to reboot with the Big Red Switch.

Other crash causes

A number of other causes for hardware system crashes exist. These causes are not unique to OS/2, however, and can affect any computer running under any operating system. The bus design of your system is important, and the environment in which your system operates is also consequential. The main culprits are system design, electromagnetic interference in the form of electrostatic discharge and radio frequency interference, and magnetic fields.

System design. Your system data bus is a possible trouble spot. The original IBM PC data bus is called the ISA bus. The ISA bus was developed along with the original IBM PC and DOS, and it was based on the assumption that the PC would be used in a stand-alone single-tasking environment. As a result, the nature of the ISA bus is not conducive to a multitasking operating system.

In a true multitasking environment, many different tasks can be under way at any given time, which can add in generating a large number of interrupts. With the ISA bus, an interrupt can be lost if it happens to occur at the same time as another interrupt. A lost interrupt causes the system to hang or lock up. Many times, OS/2's hangs on an ISA bus system are symptomatic of old hardware technology.

The PCI bus, widespread in systems today, is designed to provide a better multitasking hardware platform than the ISA bus. Not only is it significantly faster than the ISA bus, it also helps to prevent lost interrupts and reduce problems caused by Electromagnetic interference.

Electromagnetic interference. Environmental problems for computers are simi-

Listing 2: This program will lock up OS/2 by hogging all the CPU cycles.

```
#define INCL_DOSPROCESS
#include <os2.h>
#include <stdio.h>
#include <math.h>

int main(void)
{
    double    value, result;
    ULONG     Scope, count;
    ULONG     PriorityClass;
    LONG      PriorityDelta;
    ULONG     ID;
    APIRET    rc;

    PriorityDelta = 31; /* delta to process priority */
    ID = 0; /* Current process */
    value = 236723;
    rc = DosSetPriority(PRTYS_PROCESS, PRTYC_TIMECRITICAL, PriorityDelta, ID);
    if (rc != 0) {
        printf("DosSetPriority error: Return Code = %ld," rc);
        return;
    }
    for (; ; ) {
        result = sqrt(value);
    } /* endfor */
}
```


Crash Protection

lar to environmental pollution for human beings and other living things. Electronic pollution is called Electromagnetic interference (EMI). It's caused by two types of electromagnetic fields: radio frequency fields and magnetic fields. This class of phenomena affects the system hardware, but many of the symptoms can appear to be the result of problems in the operating system. Any operating system can be affected, including OS/2, UNIX, Macintosh, and Windows 95/NT.

A number of different electromagnetic phenomena can cause problems for computers and other electronic equipment. Electrostatic discharge (ESD) can occur in the autumn and winter. Radio frequency interference (RFI) can occur near radio and TV stations, radar installations, and airports. Poor grounding can cause problems of its own and can aggravate ESD and RFI.

Electrostatic discharge. ESD shows up in the autumn as the moisture content of the air, or relative humidity, decreases. During the summer, the high relative humidity keeps ESD at bay by draining the electrostatic charges almost as quickly as they accumulate.

Electrostatic charges are created when two dissimilar materials are separated. The most commonly recognized method for people to accumulate a static charge is to walk across a carpet on a dry autumn or winter day. The static charge accumulated on such a day is not noticeable until it is discharged to another object—usually a door knob or a computer—with the crackle of a spark that causes an unpleasant jolt.

ESD can cause a computer to crash in many ways. You might find that your computer just hangs. You can experience parity errors in DOS or Trap errors in OS/2. Windows could present a General Protection Fault (GPF) as the result of ESD. The symptoms vary, and the true source of the problem is difficult to determine.

The static discharged from your body is probably the least common cause of problems for your computer. The real culprit is your chair! A charge of up to 10,000 volts is generated when you get out of the chair (remember the separation of dissimilar materials). The charge is retained by the chair, because the casters on most chairs are rubber or plastic, both of which are nearly perfect insulators. When the chair touches or comes

in close proximity to the desk or cart on which your computer sits, the resultant

electrostatic discharge can, and frequently does, disrupt its operation.

Preventing EMI

Electrostatic Discharge. You can only do a couple of things to prevent electrostatic discharge. You can also take steps to ensure that when ESD does occur, the results are as harmless as possible.

The primary, and least expensive, thing you can do is prevent the buildup of static charges. The best way is to keep the relative humidity in the computer room between 45% and 70%, with 50% to 60% being ideal. This level of humidity drains away the static charge, so that the level can't build quickly enough to cause a discharge.

Another way to prevent static buildup, particularly on your chair, is to use special static-draining carpet and chairs with casters that are designed to drain static to the floor and then to the ground. This solution is obviously more expensive, but sometimes you might not have control over the relative humidity.

We have another very simple way to keep the air in your computer room moist, as well as filtered. Green, growing plants add moisture to the air and filter it, removing harmful pollutants and toxins. Plants also remove undesirable ions from the air. These attributes are good for people as well as computers.

Radio Frequency Interference. Similarly, RFI problems can't be prevented entirely, but you can take certain simple precautions. If you are located next to a radar installation, for example, even proper grounding, along with all other measures, may not be enough to prevent high-power radar pulses and radio emissions from interfering with your computer. The following suggestions should help to minimize problems with RFI.

One very common set of entry points for radiated RFI is loose system cables and missing card-slot covers. Replace them, as well as any removed covers on your system unit or attached peripheral devices. Fasten them down securely with the latches or screws provided. A missing or improperly installed system cover allows significant RFI entry into the system.

The cables that connect the various external peripherals to the system act as antennae, and they can pick up radio frequency signals and transmit them inside the system, causing problems. These cables can include the keyboard cable, the mouse cable, the serial communications and printer cables, and the parallel printer cables; as well as the audio cables if you have a sound card, the data cables to external devices, such as external SCSI hard drives or CD-ROM drives, and even the system's own power cord.

To reduce RFI pickup on cables, ensure that each cable connector is seated properly in its receptacle at both ends of the cable and that the fasteners are properly installed and in use. If screws or wire clips are used to hold the connector in place, ensure that they are tightened snugly. If cables have separate ground wires, you should connect the ground wire to the screw or fastener provided on one end only. (Connecting the ground wires on both ends can cause ground-loop currents to flow that defeat the purpose of the ground wire.)

Check the ground. Most new homes and office buildings have adequate grounding but older homes and offices might not. Even though a building is relatively new, there can still be problems, such as loose or missing connections that increase the susceptibility of the system to RFI problems. If you even suspect an EMI problem, check the ground! Computers are much more susceptible to the effects of ESD and RFI when they are improperly grounded. A quick check of your computer's ground can be accomplished with a simple electrical outlet ground checker available at most hardware or electrical supply stores. Even if the ground tests good, you could still have a grounding problem that can aggravate the effects of ESD.

The ideal ground wire installation is an insulated wire (green by convention) at least the same size as the wires that supply power to the outlet. The wire should connect only to a one-inch diameter copper stake, driven at least 10 feet into moist earth or to an equivalent copper water pipe. It should not connect to any other wire or bus at any point along its length. The connection to the ground stake should be made at a point no greater than 12 inches from the entry into the earth, and should be as close as possible to the earth.

Proper grounding is not difficult to achieve, but it can be expensive. You should definitely call a trained electrician to deal with this type of problem. Do not, under any circumstances, attempt to work on the electrical system of your home, office, or building by yourself. It can kill you.

If you are having problems, which no one can seem to fix, the important things to check are the relative humidity and the grounding of your computer. It would also be wise to consult with someone who specializes in resolving electromagnetic environmental problems.

Crash Protection

Radio frequency interference. RFI is any unwanted electronic signal transmitted or received by an electronic device. A computer can generate RFI that interferes with the operation of other electronic devices, just as other devices generate RFI that disrupts the computer. RFI can propagate through the air, as with radio waves, or through the power lines to the power plug of your computer. These unwanted signals, whatever their source and however they are propagated, can crash your computer unexpectedly or initiate any number of unusual symptoms.

Symptoms of RFI can be lock ups and hangs, trap and `SYSxxxx` errors, repeated booting, CRC and disk media errors, and internal processing errors. In other words, many of the errors caused by real hardware or software problems are also caused by RFI problems, which are just as real but harder to find, prove, and fix. Problems that can't be traced or explained in any possible way should make you suspicious of RFI.

Where does RFI come from? Nearby radio and TV stations, radar stations, microwave relay towers, and

even cellular telephones or their towers generate powerful electromagnetic signals. Because the cables attached to a computer and its peripheral devices can act as an excellent antennae, your computer can pick up the radiated signals of such transmitters. If your system is located close enough to one, you can experience problems.

Magnetic fields. Your monitor's magnetic field can cause problems if the monitor is placed on top of, or in close proximity to, your system. The cathode ray tube inside generates an image using a beam of electrons. This electron beam is swept across the CRT's face by a powerful magnetic field, which can interfere with the ability of the system to read data from the disk drive or from any device that has a cable passing too close to the CRT. This event can cause a cyclic redundancy check (CRC) error.

Almost any type of electrical device can generate a magnetic field. The best way to prevent problems due to magnetic fields is to remove the source of the magnetic field. Move the system monitor away from other devices, such as the system unit. Keep the entire system

away from large electric motors or CRT-based devices, such as television sets.

OS/2 is crash protected

OS/2 lives up to the IBM's crash-protected claims, but it's not truly crash-proof. No computer can be, because of external factors that are beyond the hardware and software designers' control. Many of the causes of OS/2 crashes are really not problems with OS/2, but the result of external factors that equally affect all operating systems. A true crash—as opposed to a single-session lockup—that can be actually be attributed to a problem in OS/2 is very rare. OS/2 is a solid platform that gets better with each release. 

David Both is president of Millenium Technology Inc. He has 21 years of experience with IBM, most recently as the lead OS/2 support person for the IBM Personal Computer Co. David is also president of the Triangle OS/2 User's Group. He is an IBM-certified OS/2 engineer charter member and is co-author of the book Inside OS/2 Warp, New Riders Publishing. David can be reached at dboth@ibm.net.

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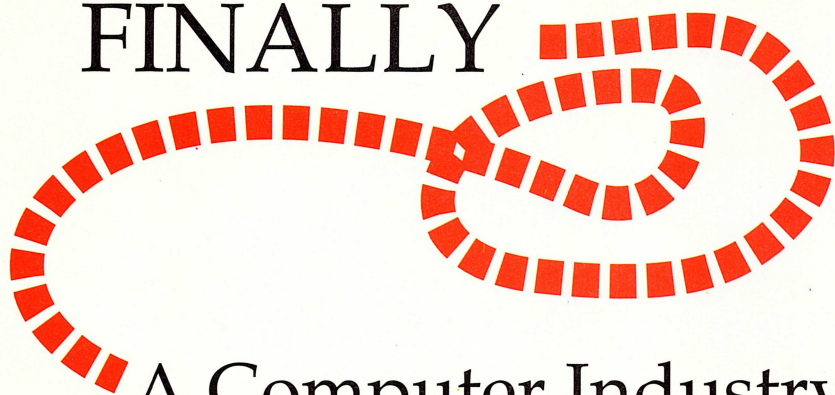
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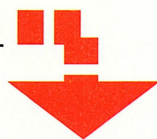
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You Could Actually Learn Something

Notes: The Next Generation

A system administrator's view of Lotus Notes Release 4. By J. C. Love

At its essence, Lotus Notes is a replicatable distributed document database system with messaging and application development. Lotus Development Corp.'s newest release of Notes, Release 4, has raised the bar for all cross-platform workgroup computing environments, which of course needed to happen as the first fruits of the \$3.5 billion IBM takeover.

There are so many changes from Release 3, including over 500 major new features, that we'll only be able to hit the high points. We've been working for the past several weeks with Release 4 installed on an IBM PC Server Model 320 with an almost-gold version of OS/2 Warp Server and a shipping version of Lotus Notes OS/2 Server. (We didn't need to run OS/2 Warp Server to run the Notes Server task, because Notes Servers are, in effect, their own network operating systems.) We also used four concurrent clients: OS/2 Warp on a Thinkpad 701C, Windows 3.1 on a Thinkpad 755CE, Windows 95 on an IBM PC 350, and System 7.5 on a PowerMac 8100.

As of the initial January 1996 release, Notes Release 4 started shipping its OS/2 and NT servers as well as its Windows 16-bit and 32-bit clients (available in 20 languages). The OS/2 and Macintosh clients and UNIX (AIX, Solaris,

HPUX) and Netware NLM servers should be available by the time this article reaches print. Lotus has also said that there will be a Windows 95 server.

Notes Release 4 is good news for OS/2 because of its cross-platform architecture, and it goes a long way toward answering the now-tiresome question, "Where are the OS/2 apps?" With the forthcoming OpenDoc capabilities in the next OS/2 Warp version, code-named Merlin, which should help Notes move quickly towards cross-platform object-oriented embedded components, interoperability of applications is becoming real. Finally.

Let's look at some of Release 4's features, as they would apply to systems administrators trying to set up a Notes site or incorporate many of this version's new functionality.

Something old, something new

Notes Release 4 contains improvements to Notes Mail, remote-user support, administration, and server functionality.

Notes Mail. Besides adopting the cc:Mail user interface, Notes Mail itself has been significantly enhanced. You and your users can use *mood stamps*, which are icons that indicate the message type; for example, confidential or urgent. You can specify that a message cannot be copied or for-

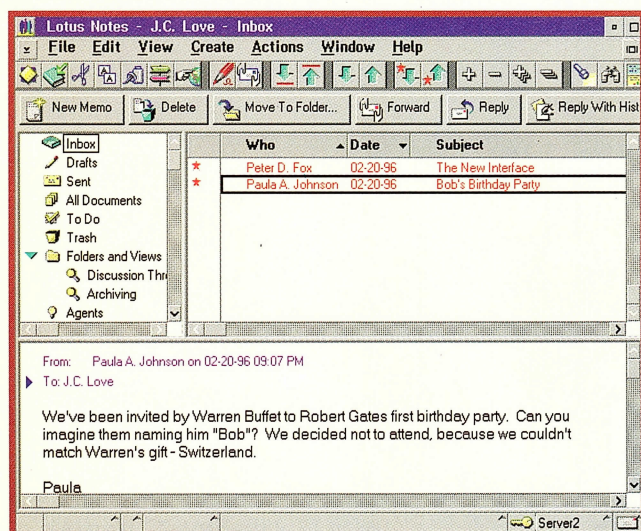


Figure 1: The cc:Mail-like user interface's upper-left pane contains navigators for various views and storage folders. The views chosen are displayed in the upper-right pane, and if a document is selected, it is pre-viewed in the bottom pane.

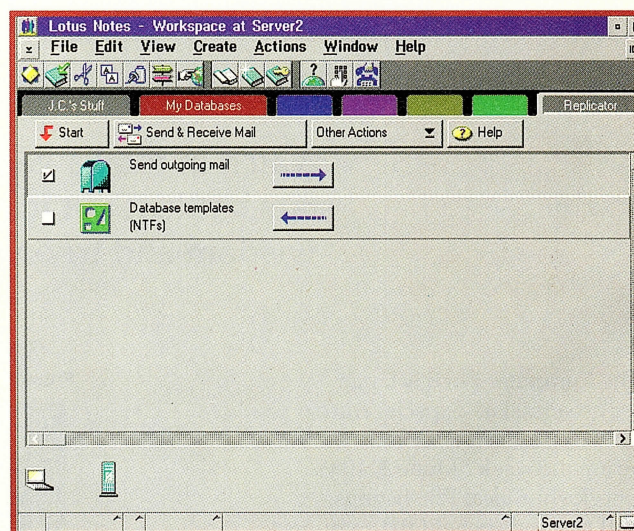


Figure 2: Appearing on every workspace, the Replicator page allows quick and intuitive settings and selection of replication options and actions. One of the button bar choices is Send & Receive Mail, making the traveler's job of keeping in touch a breeze.

The Five Most Significant Changes in Release 4

1. Undoubtedly, the most obvious change in Release 4 is the adoption of the cc:Mail user interface. Its three-pane approach to navigation, not just for mail but for every type of Notes database, makes the often-heard cry about previous versions' difficult interfaces moot. The biggest challenge that most Notes administrators will encounter will be to hold off their users' adoption of Release 4 until they're prepared from the server side.
2. InterNotes is much more than just a pretty browser. Besides making the lives of countless IS professionals easy when it comes to supplying Internet access for their users, it tightly integrates Notes databases with the Web.
3. The enhancements to Notes application development environment are so significant that traditional development tools publishers, and especially those specializing in the client/server arena, must be concerned. With the addition of Simple Actions, LotusScript, and both server and client-based agents, Notes promises to build its own universe of development, while retaining formulas and other aspects of the best of previously released development facilities. The announcement that Java will be incorporated into Notes later this year moves the target even further beyond the reach of potential Notes competitors.
4. If you're a remote user, you're going to give a standing ovation to the Notes development team. Release 4 has moved from a somewhat klutzy and frustrating remote user interface to one so elegant and intuitive that training costs will be reduced, and no one is going to complain that they couldn't get their reports in on time because they're traveling.
5. The only group that cares about the tribulations of administrators is that beleaguered group of martyrs. If you're not administering a Notes server, you won't see all of the timesaving, energy-saving, and job-saving features that have made Notes administration almost a pleasure.

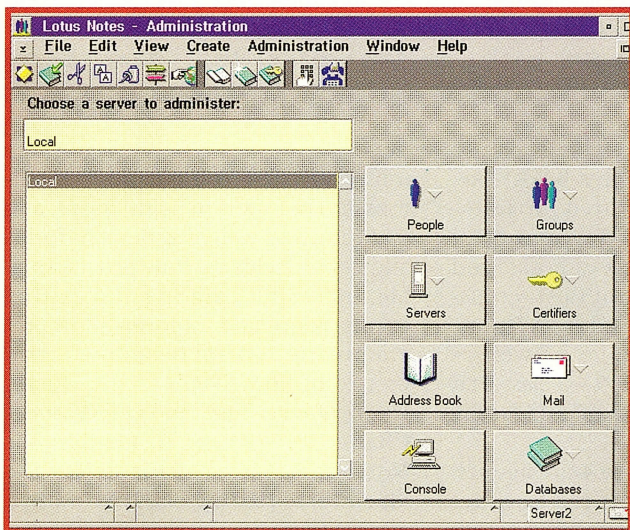


Figure 3: This screen can be displayed from the File 'Tools' Server Administration menu selection. All Notes Server Administration starts from this single point—a major change from previous releases. Notice the graphical Navigators allowing single click access to administrative functions.

warded. You can also instigate a *trace path* option, which returns the server route to the message's destination. Some predefined *agents* have been added, such as an "out of the office" message and an "add sender to address book," which automatically adds any sender's name to your personal address book if it's not already there.

If you're an administrator in a complex environment, you'll appreciate that a MAPI service provider is now in Notes Server.

Remote users. Your mobile users will love the new Mobile selection in the File menu that allows you to specify locations. It allows you to name the location, identify how to connect at that location (for example, LAN, Dial-Up Modem, Both, and None), and the details of that connection.

Let's say that one of your sales representatives lives in Los Angeles, spends time with family in Chicago, and often visits your company's regional office in Philadelphia. You can set up each of these cities as a location, specifying the time zone, the telephone number of the server you want to dial into, the prefix you need to get an outside line, the country code, the area code, the home mail server, and your mail file location (on the server or a replica on your local hard drive). When the location is LAN-connected, you can even create a replication schedule for local replicas.

Administration. The Address Book has been completely redesigned to make management simpler. These changes were aimed at the problems that large Notes environments have experienced with previous releases, but they've made administration of all Notes implementations easier. The new Address Book consolidates the management of companies, servers, groups, persons, and locations.

Whether you're accessing the Database Properties InfoBox, Access Control List settings, opening, creating, copying, deleting, publishing the database in a library, accessing its design information, or refreshing or replacing that design from a template, you work from a single location in the File menu.

Replication now occurs at the field level, saving time and

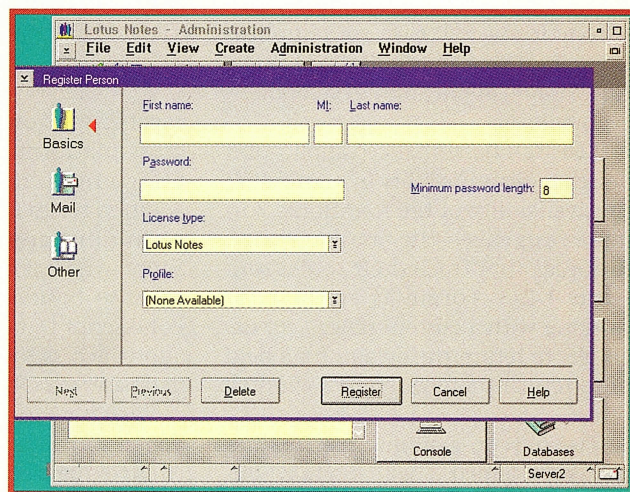


Figure 4: Notes Release 4 administration, with the Register Person dialog is displayed. The navigators on the left side change the form to allow the organized input of various kinds of information without crowding the screen.

its associated connection expense as well as reducing its impact on server resources.

Notes servers. There have been several design changes and enhancements to Notes servers. SMP (symmetric multiprocessing) has been enabled for as many as six processors. Lotus says that Release 4 will now support as many as 1,000 users on a server, up from 200, although they suggest that 500 concurrent users may be a realistic limit. They also indicate that database sizes can be increased by up to 300% from Release 3's limits.

New centralized management tools have been included. Servers are now SNMP-compliant. A Notes server can now be managed remotely from a console, and its status can be viewed in real time.

A previously glaring omission has also been satisfied: server pass-through capability has been added, allowing you to access one server via a different server. Hierarchical naming has been implemented, which is a significant management enhancement for large enterprises. Server-based agents (our discussion of agents is still to come) are now allowed.

Application design

Release 4's application design environment uses the same new cc:Mail-like user interface. Nonscrolling action bars and collapsible sections on your forms and views really add to your applications' usability. Subforms are new in Release 4, and their reuse among forms will ease your applications' maintenance as well as make Notes' rapid application development even quicker.

Release 4 has enhanced application design programmability by continuing the availability of the traditional Formula Language—the familiar @ sign formulas that trace their roots from Lotus 1-2-3. Formulas are best for working with a current object, for example, to return the default for a field or to return the document's window title.

Two new programming capabilities have been added. The first one is Simple Actions—such as **ReplyToSender** or **SendMail**. Simple Actions will make many of the programming effects you'll want to create, well, simple.

The second new programming

capability is LotusScript, a BASIC-like, cross-platform structured programming environment. This powerful addition is best for processing data and controlling application flow. LotusScript, which is compiled at save-time, can use Lotus Formulas as well as LotusScript Data Objects—a class that allows access to relational and legacy databases via ODBC.

Also new in Release 4 are agents. When activated, agents can be either event-triggered or time-triggered, either server- or client-based, and can use any of Notes' programming constructs—Simple Actions, formulas, or LotusScript.

The Release 4 programming envi-

Notes Meets The Internet

Notes Release 4 has Internet access built into it. That may seem fairly trivial, but because the implementation has been tightly integrated into the Notes paradigm, the result is compelling.

Included with Notes Server is a module called InterNotes Server, which consists of a database and a server task that you load on the Notes server with the Notes server command, **LOAD WEB**.

Then your Notes users can surf the Web by opening the InterNotes Navigator database on your Notes server and by entering a URL (Uniform Resource Locator) in the now ubiquitous `http://<address>` format. You don't have to have TCP/IP on the client, because it's communicating with the server via whatever protocol is being used for your Notes network; for example, NetBIOS. The InterNotes Server will use HTTP (Hypertext Transport Protocol) over its TCP/IP connection to the Internet to attempt to access the identified Web server and, if successful, to retrieve the requested Web page. InterNotes Server then translates the Web page into a Notes document and stores it in its Notes database. That document is sent on to the Notes desktop for display.

Does this sound like jumping through hoops to do something pretty simple? Perhaps, but let's look at the overall result. You avoid having to maintain TCP/IP addresses and stacks for all your workstations just to allow Web access. Also, you don't need to install a Web navigator such as OS/2's Web Explorer for each of your users. In a heterogeneous environment, not having to support one kind of navigator for OS/2 Warp, another for Windows, and still another for the Macintosh, lowers support requirements even further.

There's more. Retrieved Web pages are stored as Notes documents. When you request a Web page, a spinning globe on your Notes Navigator display graphically indicates when the document is being accessed from the Internet, either because it doesn't exist in the database, or if it does, it's because an expiration date has passed or you have used the Reload button to update it. If you request a page that is currently stored as a document in the database and doesn't need to be refreshed, the globe doesn't spin (in fact, you don't even see it), and response is immediate.

Let's take this a step further. Many Web pages use fill-out forms to gather input from readers. The Web Navigator automatically creates a Notes form when you open a page in the Web Navigator database that contains fill-out fields. You can fill out the form and use it to send the requested data back to the Internet server. If the Internet server sends a response page back to you, it's saved in your private folder in the Web Navigator database, so you're the only one who can read it.

There's still more. You can replicate across the Internet, and you can set replication timeouts to account for Internet unpredictability. In addition to HTTP, InterNotes supports both FTP (File Transfer Protocol) and Gopher access. The included InterNotes Web Publisher lets you translate Notes documents into Web pages. If, for example, your firm's product catalog is in Notes databases, you can easily create your own Web server pages with your catalog information, giving the public access over the Internet, and further, pulling the information in your fill-out fields back into a Notes database to provide data for your company's marketing activities.

If you listen to IBM executives, you often hear "Notes" and "The Internet" in the same breath. In the case of Notes Release 4, they've really combined them into the same product.

ronment is rich. You can program buttons and hot spots in fields, forms, and navigators, as well as actions in forms and views. Fields are fully programmable, including entering and exiting events. Forms and subforms allow programmatic control over document-processing flow. Events such as **QueryOpen**, **QueryClose**, and **QueryModeChange** are available. In addition, the Notes API is now available for the Macintosh, joining OS/2, Windows, and UNIX.

The Notes Release 4 programming interface includes an editor, a set of debugging utilities, which has a breakpoint panel, a variable inspector, an output window, and a browser.

Something Borrowed

Lotus's cc:Mail has long been considered to be one of the industry's best e-mail systems (in fact, the OS/2 client won a 1994 *OS/2 Magazine* Editors' Choice award). Notes Release 4 has adopted its three-pane user interface. The navigation pane appears on the left side of your screen, and the view pane lists documents and displays on the right. The document preview pane is across the bottom. This interface gives you powerful navigating capabilities as you move among document storage locations, document selection, and viewing.

The menu bar doesn't look much different, but menu selections have been rearranged to make more sense. For example, Tools are in the drop-down **File** menu, and all the housekeeping items you'll want to use are located there, including User Preferences; the SmartIcon configuration; user ID functions such as setting passwords, switching IDs, and locking a current ID; and Server Administrative functions.

Notes tool bars containing SmartIcons are now context-sensitive. The implementation isn't perfect, but only seldom can you see an icon that is inoperative in the current context.

InfoBoxes. These are a special kind of dialog that Lotus has been implementing in its SmartSuite products and are new in Release 4. They have tabbed pages which, like OS/2's settings notebooks, allow you to have access to many options without being overwhelmed. They're different from typical application dialogs in that they can be left open while you're working, and settings are immediately effective. You'll find that not needing to click **ok** to continue working becomes very comfortable very quickly.

An example of an InfoBox is Database Properties. Its Basics page, the first of six, allows you to set the database's name, its type, its encryption level, and its replication settings, and to view its replication history. Other pages in the same InfoBox give you access to the database's size, its user activity, its printing settings, its design, the defaults used when it is launched, and its text-indexing settings. Each of those pages allow you to drill down to more detailed settings and informational levels.

Right click. The right mouse button has been activated across platforms and causes a **Context** menu to appear. Do you think Apple will ever replace the Mac's single-button mouse with a three-times-more-functional (left, right, both) two-button model? The Macintosh that doesn't have right mouse button-initiated **Context** menus is one of the few differences in the user interface implementations across platforms, and while few exist, this one stands out. We congratulate Lotus for not succumbing to the lowest common denominator in this case.

Twisties and nonscrolling button bars. Forms and views can have nonscrolling button bars that change with the current context. In Release 3, buttons had to be embedded in a form and often scrolled out of sight. And just as significant, forms can have collapsible sections that are headed by a title and a *twistie*. A twistie is a little triangle with its apex pointing right if its associated section is collapsed, but pointing down when the section is expanded. Views use twisties also, indicating the collapsed or expanded status of the view.

Navigators and hot spots. Release 4 allows the use of *navigators*, which are graphical presentations usually appearing in the left navigation pane of the user interface. The standard navigators that Notes provides appear as folder icons, but they can be programmatically changed to other graphics. *Hot spots* are new in Release 4 and are defined areas of a document, such as text or a graphic, that can be programmed to let a user perform an action.

Replicator page. There is now a Replicator page on the Workspace, which is a boon if you're a remote user. You can easily point and click to begin replication and can limit replication to your mailbox if you wish. You can add a document link or a URL (Uniform Resource Locator) to any document. You can now initiate a search using a powerful point and click query builder. You have the ability to view attached documents, without launching or detaching, with more than 150 file viewers for spreadsheet, word processing, presentation graphics, and other file types. Improved document-editing enhancements are available, such as named styles and table formatting, as well as Permanent Pen, which allows you to maintain a standard editing property set.

Object linking

Lotus has spent a great deal of effort developing its Windows clients as full OLE 2 containers and OLE 2 clients, supporting in-place editing and drag and drop. If you're deploying non-Windows clients, then this is important to note, because Microsoft's Object Linking and Embedding technology is not cross-platform, and applications developed with OLE exclude Macintosh clients, all versions of UNIX, and our favorite, OS/2 Warp. Not only that, but OLE's performance, or the lack thereof, is reason enough to avoid OLE.

We'll care much more about object-oriented component architecture when OpenDoc is fully available. OpenDoc reportedly will operate with OLE, and so at least OS/2 Warp and Macintosh should not be excluded from OLE apps. Whether any of these

technologies will perform acceptably across the wide variety of client computers in most enterprises remains to be seen.

Release 4 challenges

Let's start with what *won't* be a challenge: training. Users who are upgrading from Release 3 will find the user interface so consistent and usable that almost all will intuitively understand how to use Release 4.

The big challenge will be for those managing an enterprise upgrade. Using Release 4 servers with Release 3 clients will cause problems, but not serious ones. Most of those problems will occur when someone installs a Release 4 application. Users with Release 3 clients will be frustrated while trying to run it, because client-based agents won't work, collapsible sections won't appear, subforms won't

be available, button bars won't appear, and so on.

However, running Release 4 clients with Release 3 servers may be disastrous. If the users with Release 4 clients don't change any forms or views or add any agents, in other words, use nothing from the Release 4 environment, there won't be a problem. Our experience is that the opposite will occur, and a lot of time will be spent restoring databases from back-up tapes. You do back up, don't you?

We highly recommend upgrading your servers first. Make sure that if you have more than one, you have correctly implemented server replication. And then upgrade the clients, as quickly and completely as possible. A word of warning: it'll be difficult to hold off your users—as they hear about Release 4, they'll want it, and they'll want it now.

Tips for Release 4 Administrators

Make sure your servers and clients have enough memory. An OS/2 Notes server will need 16 to 32MB for up to 64 users. If you're going to enable the InterNotes Web Navigator, you'll want an additional 32MB plus 2MB for each concurrent Web retrieval process. We think that 80MB is a nice round number.

During the installation of a client, make sure you check "Overwrite Files." Otherwise you may have some very strange things occurring that you'll never track down without a complete reinstall of Notes.

If you have AppleTalk on your LAN, you may want to use it for Notes and your Mac clients. It's easy to provide an AppleTalk connection on your Notes server, and you'll be able to avoid all the administrative headaches of TCP/IP. You can run NetBIOS with your OS/2 Warp and Windows clients or even tag on to IPX if you've got Netware running.

Order copies of *A Beginner's Guide To Lotus Notes* from Lotus for each of your users. It's part number 12392. You'll appreciate it almost as much as they will.

Move your Web surfers to InterNotes and insist that your users, who are new to the Internet, access it through Notes. You'll congratulate yourself later.

Make sure each user who will manage a database has the *Database Manager's Guide* (Lotus part number A80500). It covers the four critical aspects of managing a database: putting a database into production, controlling access to a database, controlling replication, and maintaining a database. The one copy included with a Notes starter pack won't be adequate.

The warts

All the problems we've found with Notes Release 4 revolve around the clients that were still in beta at the time this article was written. Specifically,

the OS/2 Warp client and the Macintosh PowerPC client have occasionally crashed.

We have not tested the Macintosh 68000 client or any of the UNIX Notes

code, nor have we tested a Netware NLM. They are all still in beta, so any testing at this point would not be particularly telling.

Bottom line: We're very impressed with Lotus Notes Release 4. We've been working with Release 3 for some time and find that everything we've wanted has been included, as well as many things we never thought about. The only real challenges we expect you'll face will occur if you're upgrading from a previous release. We envy those who are going to implement Notes for the first time with Release 4. **OS/2**

J. C. Love develops and presents technology seminar tours for Right Source Inc. Currently, he is responsible for a 27-city Lotus Notes and IBM PC Server tour. In addition, he consults with small- and medium-sized businesses on information technology issues. Previously, J. C. was an IS Manager at UCLA. He can be contacted at 72241.1006@compuserve.com.

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no wonder, really. When you take the product voted best in category both in the United States and Internationally, listen to our customers, and apply all that you have learned, you can accomplish amazing things. So when we started with our best-selling desktop management software, **DeskMan/2**, and enhanced all of the features you have come to depend upon, we knew that you'd be happy. But we didn't stop there. After all, the new version 1.51b has ten times the functionality of the original release, you can imagine that **DeskMan/2** version 2.0 was to be something very special.

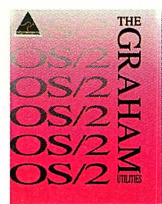


Now Available-DeskMan/2 version 2.0

Powerful new facilities, such as the MultiDesk™ Personal Desktop Facility, continuous Workplace Shell backup, live desktop synchronization, improved & expanded access control, user defined Workspaces, and context sensitive tools, are just a few of the enhancements we made to version 2.0. In addition, the familiar facilities for enhancing, managing, securing, backing up, standardizing, and personalizing the OS/2 desktop are all improved.

We went through all of the requests and comments that you have sent us over the years, and addressed each one of them! From the individual with a single standalone PC, to the corporate user with thousands of connected desktops, every feature and function was designed with your requirements in mind. You might say that **DeskMan/2** version 2.0 is a collaboration between **DevTech**

and our customers. The result is a unique combination of old and new features, turnkey functions, and customizable capabilities that directly address your problems.



And this is just the beginning. **DevTech** is working closely with IBM to enhance every member of our product family, and to support IBM's key initiatives for network-centric computing. The Graham Utilities, the only LAN compatible disk recovery and file management tools are enhanced with a host of new features, improved performance, and top quality FAT

support, in addition to the superb HPFS support they are known for worldwide. DCF/2, our disk compression facility, has been rewritten with three goals in mind: lightning performance, rock solid reliability, and increased ease of use. And all of our products will work with IBM's unified network management tools.

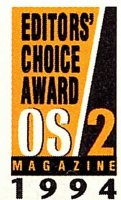


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Reader Service No. 16

Learning the Enhanced Editor

There's more to EPM than meets the eye. **By Bill Schindler**

When it comes to working with words on your computer, whether writing a letter or editing a configuration like *autoexec.bat*, you have a choice of two types of tools.

Word processors, like DeScribe, AmiPro, ClearLook, or IBM Works, are designed to make your document look professional when printed. That's great, when the end result is a printed page.

The other type of tool is a text editor. Text editors are optimized for situations when the text itself, not its appearance, is important. Simple text editors, like OS/2's built-in System Editor, are small and fast—ideal for helping you print a *readme.txt* file or for making quick changes to your *config.sys* and *startup.cmd* files. More complex text editors are best used for helping programmers work more efficiently, because they can understand the syntax and formats of different computer languages. For example, these text editors help programmers by completing keywords or indenting code automatically to highlight a program's structure. An advanced editor can edit many files simultaneously, allowing you to coordinate changes between several related files with ease.

One such advanced text editor is IBM's Enhanced Editor (EPM), which is included with OS/2. EPM's power is often easily overlooked, perhaps because it's included for free. Even if you try EPM you're likely to be underwhelmed, because, unless it's configured and used properly, EPM doesn't appear to offer much more than the System Editor other than slower start times. In fact, EPM is a full-featured user-configurable editor, but most of its power is hidden by a lack of thorough documentation.

Let's look at how to change some of EPM's settings to make it more useable, while exploring many of its valuable, but lesser-known, advanced features. (*OS/2 Magazine* last

covered the EPM in "A Secret Guide to the Enhanced Editor," July 1994, and in "103 Tips," September 1995).

Faster startup

The first problem you may encounter is *finding* the Enhanced Editor. OS/2 Warp installs EPM's program object inside the **Productivity** folder, which is inside the **OS/2 System** folder. You can copy or shadow the program to the Desktop, but if you want to make EPM load faster you need to create an EPM book.

An EPM book helps EPM start faster and allows you to edit files using drag and drop. The EPM book appears as an icon on your OS/2 desktop, so it also gives you quick access to the editor. Here's how to do it:

- Create a new EPM program object by copying the Enhanced Editor program object (in the **Productivity** folder). You can put a new EPM program object in the **Productivity** folder or in any folder that seems convenient.
- Open the Settings notebook for the EPM program object by right-clicking on the object and selecting **Settings...**
- Select the **Program** tab and add */i* in the **Parameters** field.
- If you'd like, set a default directory by entering the desired directory in the **Startup Directory** field. EPM will default to loading and storing files in this directory.
- Select the **Window** tab in the Settings notebook and select "Minimize window to desktop." If you do not select this option, the EPM book will not work correctly.
- Close the Settings notebook.
- Shadow the new EPM program object to the **Startup** folder.
- Test the EPM program object by double-clicking on it. A minimized EPM icon should appear at the bottom of your screen. This icon is the EPM book.

EPM starts faster with the EPM book loaded, because the book keeps the Enhanced Editor partially loaded all of the time. The EPM book also offers other benefits: You can start the editor using drag and drop. If you drag a file and drop it on the EPM book, the Enhanced Editor will open with that file loaded. You can also double-click on the book to select and edit a file.

Window dressing

When you launch EPM it looks a lot like the less-powerful System Editor, with a few differences. One is a "Top of File" and a "Bottom of File" line in the editing area (Figure 1).

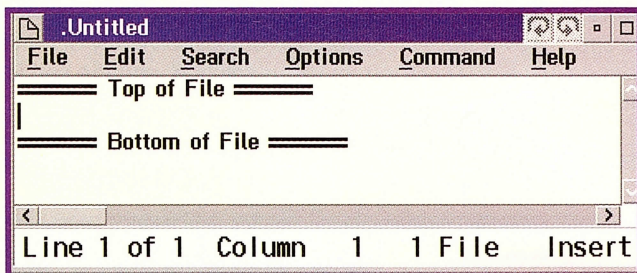


Figure 1: The Enhanced Editor looks similar to the more rudimentary System Editor but has a more informative display.

Near the bottom of the window is a status bar. This status line does double duty, most of the time it tells you the current location of the cursor, number of files loaded, and the insert/replace mode. The status line is also used to display editor messages. The title bar tells you the name of the current file. Additional icons will appear in the title bar when you change some options.

One annoyance is that EPM always starts with a default window size that never seems to be the right size. To force EPM to start with your choice of window size, first resize the EPM window. Then, select **Options**, then **Save options** from the menu.

You may want to change the font and font size (to one you like better) before you resize the EPM window. To change the font:

- Select **Options, Preferences, Settings...** from the menu. A Settings notebook will open.
- Select the **Fonts** tab.
- Pull down the list of fonts and select a font. Because many of EPM's operations work best with a nonproportional font (where all the characters have the same width), I'd recommend the System VIO, System Monospaced, or Courier fonts.
- Adjust the font size until it's a comfortable size.
- Click on the **Set** button to save the font settings.

If you want the EPM window sized to exact character widths (so it doesn't show cut-off characters), use the **trim** command. With EPM running, press <Ctrl+I> to open the command dialog. Then, type the command **TRIM** and press <Enter>. EPM will resize the window to the nearest character width and height. To save the setting, select **Options**, then **Save options** from the menu.

Setting up an edit ring

An edit ring allows you to load several files into a single edit window. To turn on the edit ring, select **Options, Preferences**, and then click on **Ring enabled**. Two ring icons will appear on the right side of EPM's title bar. Select **Save options...** from the **Options** menu to always launch EPM with the edit ring enabled.

Once the edit ring is enabled, EPM adds some additional options:

- Add files to the edit ring by selecting **File, Add file** from the menu or by pressing <F8>.
- Remove files from the edit ring by selecting **File, Quit file** from the menu or by pressing <F3>. Quitting from the last file in the edit ring closes the edit window.
- List and jump to files in the edit ring by selecting **Options, List ring...** from the menu or by pressing <Ctrl+G>.
- Move to the next file in the edit ring by clicking on the right edit ring icon (on the title bar) or by pressing <F12>.
- Move to the previous file in the edit ring by clicking on the left edit ring icon (on the title bar) or by pressing <F11>.

Entering file names

Now that you have an edit ring enabled, you have some new

options available for loading files. When you press <F8> to add a file to the edit ring, the dialog box that appears lists any files that you have edited before. If you wish to load one of those files again, double-click on the file name. Once you have edited several files, scrolling through the list of names may become tedious. A quick search method is:



Figure 2: EPM's search dialog box is deceptively simple; it offers far more power than a typical word processor's text-search engine.

- Press the up-arrow key. The first name in the list will be highlighted and copied to the entry field.
- Type the first character of the file name that you want to load. EPM highlights the first file in the list with that name.
- Repeatedly typing the first character moves through all the files in the list beginning with that character.

If you want to load several files with similar names, you can use a wild card in the file name. For example, by entering `d:\stuff\test.*`, you could load all the files beginning with `test` in the `d:\stuff` directory.

EPM provides a handy shortcut when you want to edit a file with a name similar to the current file in the edit ring. For the parts of the file name that are identical, use an equal sign and you only need to type in the parts of the file name that are different. The most common use is to load a file from the same directory and type `=` followed by the file name. Assuming the current file in the edit ring is `d:\work\test1.cpp`, here are some other possible ways of using the `=` shortcut:

```
=.idl loads D:\Work\test1.idl
d:\old\=loads D:\old\test1.cpp
=test2.=loads D:\Work\test2.cpp
```

Renaming a file

You can rename a file by selecting **File, Rename...** from the menu or by pressing <F7>. Either method opens a dialog box so that you can edit or enter the file name. A more direct route, however, would be to put the mouse pointer over the title bar and double-click the right mouse button. The title bar will change to an edit field so that you can change the file name. When you're done, click the mouse anywhere off the title bar and the file will be renamed.

Make sure you press <F2> (or select **File, Save** from the menu) to save the file using the new name.

Setting up a shell

A shell is an OS/2 command prompt that runs within EPM.

You start a shell by opening the EPM command dialog (press <Ctrl+I>) and entering the **shell** command. A new file named `.command_shell_1` is added to the edit ring.

You can run most text-mode applications from the shell, but if a program prompts you for input, you will be unable to enter the input directly from the shell. To send input to a program, select **Command, Write to shell...** from the menu, enter the input in the dialog, and press <Enter>.

The shell offers a few advantages over using a normal OS/2 command prompt. Because the shell is running in an EPM edit window, you can copy text, delete lines, and perform any other manipulations that you would in a normal edit window. You can also scroll back through the entire session. If you want to re-execute an earlier command, put the cursor on the command and press <Enter>.

Another advantage of the shell is that you can use it to load files into the edit ring without typing the file name at all. Here's how: In the shell, change to the directory that contains the file you want to edit (such as by typing `cd \work`). Type "dir" and press <Enter> to get a directory listing. Move the cursor up to the file name that you want to load into the edit ring, and press <Alt+1> to load the file.

Navigation

Most of the keys that you commonly use to move around inside your favorite word processor have the same meaning in EPM. The up and down cursor keys move up and down a line at a time; <PgUp> and <PgDn> scroll up and down a page at a time. <Home> moves to the beginning of the line, and <End> moves to the end of the line. <Ctrl+Home> moves to the beginning of the file, and <Ctrl+End> moves to the end of the file.

If you want to go to a specific line, open the command dialog by pressing <Ctrl+I> and enter the line number.

Search and replace

You can open the Search dialog by selecting **Search, Search...** from the menu or by pressing <Ctrl+S> (Figure 2).

The Search dialog allows you to

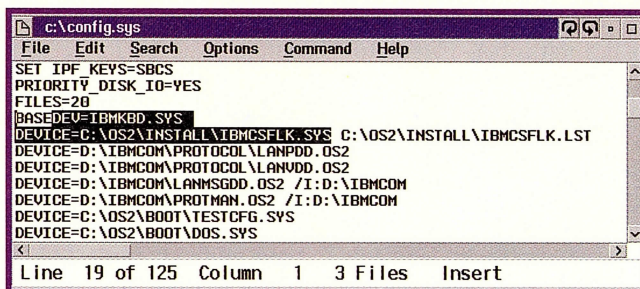


Figure 3: EPM's character-marking ability is like what you'd find in most OS/2 applications; where everything between two characters is marked for further operations.

search or search and replace. Searches are performed from the current cursor position forward to the file's end. If you want to search the entire file, press <Ctrl+Home> (to go to the beginning of the file) before performing the search.

The Search dialog stays open until you cancel it. If you have enough room on the screen, you can park the Search dialog to one side and edit the file rather than opening and closing the dialog for each search.

The **grep** option in the Search dialog is an advanced option that allows you to search on regular expressions using the common UNIX format. This one option is a whole topic in itself, so I won't be covering it in this article.

The other options should be self-explanatory.

If you haven't selected the **Change all occurrences** option, you can use the **Find** and **Change** buttons to perform the equivalent of a prompted search and replace. Press "Find" to locate the first occurrence of the search string. Press "Change," then "Find," to change that occurrence and locate the next occurrence. Press "Find" to locate the next occurrence without changing the current one.

Murky marking

One of the most confusing parts of EPM is the number of marking modes (used to select text) and operations that it supports. EPM supports basic and advanced marking modes. The basic mode is identical to the marking used throughout OS/2 and is the default marking mode in EPM. The advanced mode offers more power at the expense of compatibility and the use of the <Alt+letter> keys to access the pull-down menus. To turn on advanced marking mode:

- Select **Options, Preferences**, and click on **Advanced marking** from the menu. (A check mark should now appear next to the **Advanced marking** menu item.)
- Select **Options, Preferences**, and click on **CUA accelerators** from the menu. (There should now be no check mark next to the **CUA accelerators** menu item.)
- Select **Options**, and **Save options** from the menu.

The **Advanced marking** mode gives you three marking styles: character marks, line marks, and block marks.

The character mark is the style of marking that you see in most OS/2 applications, where the mark begins and ends at character positions in the file. Use the character mark to mark a word or a sentence in this way (Figure 3):

- **Keyboard:** With the cursor just to the left of the characters that you want to mark, press <Alt+Z>. Move the cursor until it's just to the left of the last character you want to mark. Press <Alt+Z> again.
- **Mouse:** Put the mouse pointer just to the left of the characters that you want to mark. Press and hold the <Ctrl> key and hold down the left mouse button. Drag the mouse pointer over the characters that you want to mark.

The line mark marks one or more lines. If you want to mark a paragraph or one or more lines of code, you'd use the line mark this way (Figure 4):

- **Keyboard:** With the cursor on the first line you want to mark, press <Alt+L>. Move the cursor to the last line you want to mark. Press <Alt+L> again.
- **Mouse:** Put the mouse pointer on the first line you want to mark. Press and hold the right mouse button and drag the mouse pointer down over the group of lines that you want to mark.

The block mark marks one or more columns. Use this mark to perform operations on columns of text (Figure 5):

- **Keyboard:** With the cursor on the first column you want to mark,

Enhanced Editor

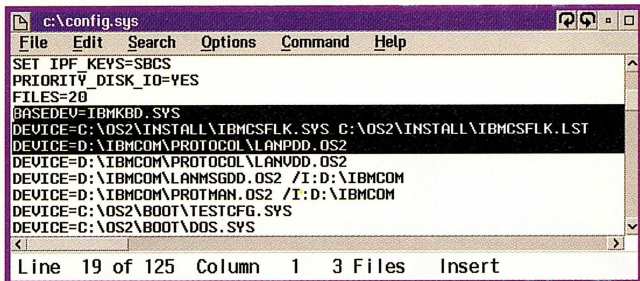


Figure 4: By using line marking, you can quickly mark one or more complete lines of text.

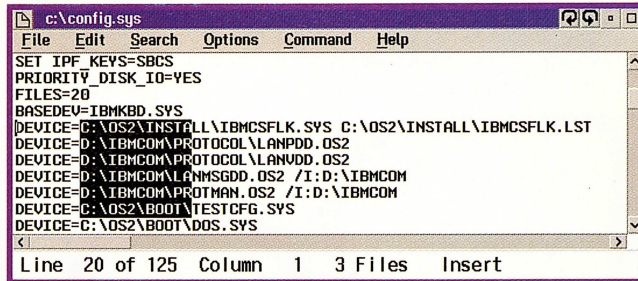


Figure 5: Block marking lets you highlight discontinuous text within certain columns.

press <Alt+B>. Move the cursor to the last column and line you want to mark. Press <Alt+B> again.

- **Mouse:** Put the mouse pointer on the first column you want to mark. Press and hold the left mouse button and drag the mouse pointer down over the columns you want to mark.

Operations on marks

Now that you've marked something, what can you do with it? Here's a sample of some of the operations that you can perform on marks:

- Unmark it by pressing <Alt+U> or by double-clicking the left mouse button.
- Delete the mark by pressing <Alt+D>.
- Copy the mark. Move the cursor to the destination and press <Alt+C>.
- Move the mark. Move the cursor to the destination and press <Alt+M>.
- Shift the mark left or right. This operation only works on a line or block mark. Press <Ctrl+F6> to shift the marked text left; <Ctrl+F7> to shift the marked text right. Characters that are shifted out of the mark are permanently deleted.
- Change the marked text to upper or lower case. <Ctrl+F3> uppercases the marked text; <Ctrl+F4> lowercases the marked text.
- Sort the marked lines. If the lines you want to sort are line marked, they will be sorted on the first 20 characters of each line. If you block mark a column, the lines will be sorted on the text in the block mark. Press <Ctrl+I> to open the EPM command dialog and enter sort.
- Fill the mark with a character. Press <Alt+F> and type a character. The marked area will be filled with that character.

Taking it from here

If you would like to explore further on your own, a good place to start is to browse through the **Help** menu. The Help, Keys help, and Help Quick reference are especially beneficial. Don't be afraid to play a little and find out for yourself what some of the keystrokes and options do.

The Enhanced Editor has a lot of functionality hidden in what first looks like a rather simple text editor. We've gone only slightly below the surface to give you a sample of what you can do with EPM. But you should know

enough now to begin tapping into the power of the Enhanced Editor. **OS/2**

Bill Schindler has used just about every editor, operating system, and computer language available. He wrote Teach Yourself REXX in 21 Days and is currently working on a book out OpenDoc programming. Bill is editor of the Phoenix OS/2's Society's publication, Extended Attributes, a sysop in the CompuServe OS2AVEN and OS2-BVEN forums, and (just to prove he has a real life) has won awards for his home-brewed beer.

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Parts is Parts

A CD-ROM is shown at an angle, its surface reflecting light. The CD has a blue and white design with the number '8' and the text 'The Developer Connection for OS/2'. Behind the CD is a mechanical assembly constructed from red and blue perforated metal plates, connected by silver-colored metal rods and featuring two large black wheels. The background is a solid blue color.

“I have seen the future, and it is composed of parts.” Sure, you’ve heard a similar refrain before. Maybe it was at the dawn of procedural programming, or objects, or C or Pascal. Every new technology is touted as solving the world’s problems, or at least the things that make life difficult for programmers. While there is a good amount of hype out there, IBM’s VisualAge C++ 3.0 is a tool that may finally convert you to a believer in parts.

Remember your joy when first using the Dialog editor for Presentation Manager (PM) programming? And then your dismay when you discovered that it only allowed you to draw the interface, not implement it? Well now it’s the ’90s, and IBM’s Visual Builder delivers what the Dialog editor only promised.

Back in March, we began to explore the latest incarnation of VisualAge C++, which added Visual Builder and other tools to IBM’s CSet++ compiler (“Not Your Father’s C Compiler,” p. 38). We’ll continue our tour by using Visual Builder to create a simple text editor without writing a single line of code. The only requirement necessary is the ability to wield a mouse and click a few buttons. How can this be possible? Parts.

Parts is parts

Before you start screaming; yes, the word ‘part’ is suffering the same overhyping as ‘object oriented,’ ‘user friendly,’ and ‘client server.’ But really now—what is a part?

As far as Visual Builder is concerned, a part is simply a C++ class with a defined interface. This is similar to the way Workplace Shell objects and VBXes are just dynamic link libraries (DLLs) with a defined interface. The defined interface just makes it easier for parts (classes) to interact.

This defined interface gives parts three types of features. Attributes are the equivalent of member variables in a C++ class. For example, a button part has a `text` attribute from which you can get and set the text of the button. Actions are like member functions in a C++ class. You might call the action named `show` to display a button. And events are similar to Presentation Manager messages. A button part has a `buttonClickedEvent`, which can be used to notify other parts that the user clicked the button.

IBM’s Open Class library is the basis for the parts in VisualAge C++ so, if you’re familiar with Open Class, you’re ahead of the game. Parts can be visual (such as a button) or nonvisual (a collection, for example). You can make connections and change attributes of both visual and nonvisual parts in the Composition Editor, but you can resize and shape only visual parts.

The parts that come with the product are primitive: they can’t be broken down into smaller pieces. You can make complex parts by combining primitive parts together or even by combining other complex parts.

Now that we’ve defined parts, how do they fit together? Using Visual Builder is basically a three-step process:

- Use Visual Builder’s Composition Editor to lay out your

visual and nonvisual parts on a work surface. You use the Parts Palette to select parts and drop them on the work area. Then you make connections between parts. For example, you could connect a `buttonClickedEvent` from a button to the `show` action of a message box to display the text attribute from an entry field.

- Save your parts to a `.vbb` file. You can give or sell this `.vbb` file to others, and that’s all they’ll need to use your part.
- Use the Composition Editor to generate C++ source code from your `.vbb` file and then compile and link it to produce your final program. You don’t need any run-time modules from Visual Builder to distribute your program other than the DLLs from the Open Class library.

Let’s use the Visual Builder to make a simple text editor. By the time we’re done, you’ll see that Visual Builder is much more than an application generator. It will let you create your own parts that you can reuse in multiple projects.

Beginning a project

To start a text editor project, open the **VisualAge C++** folder, then open the **Project Smarts** object. Select **Visual Builder Application** and press **Create**. Enter the project name (“LouEditor” has a nice ring to it), project location (your **Desktop** folder), and files location (where the source code files will be stored) when prompted (Figure 1).

A **LouEditor** object will be created automatically. Open the project, and you’ll see only two files: `read.me` and `win-menu.vbb`. Double-click on `read.me` to read it, open the `.vbb` file by double-clicking, and follow the directions from the `read.me` file.

After Visual Builder generates the source code for the pro-

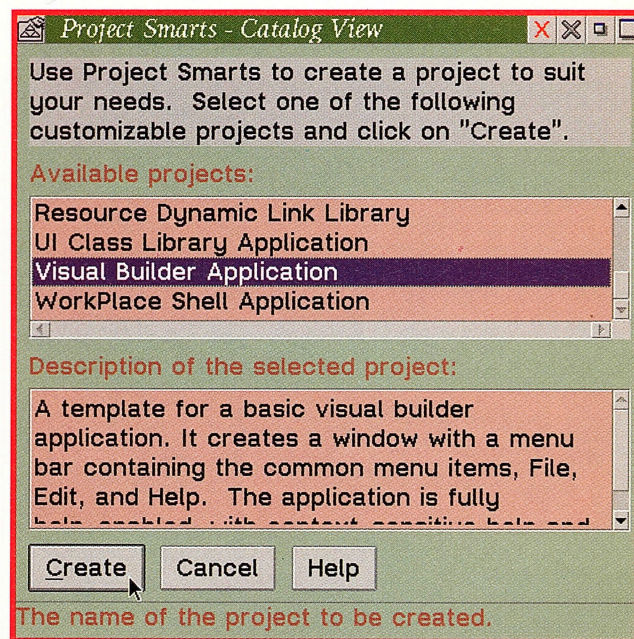


Figure 1: Use the Project Smarts object to quickly start a Visual Builder application.

ject, you'll end up with nine files: the two files with which you started, a .log file, and six source files. Press the **Build** button in the **Project** folder to build the project, then press the **Run** button to run it. An application titled "Frame Window" comes up. It's a typical PM app with a frame window (title bar, minimize and maximize buttons, system menu, menu bar, and resizable border) and three buttons. Only **File→Exit** and **Cancel** work at first. Close the app. So far you haven't expended any real effort, and you've got a good portion of the user interface up and running.

Composition editor

Your main interaction with Visual Builder is the Composition Editor (Figure 2). Here is where you do the fun part of dragging and dropping parts onto the work area, and making connections between them. Get used to it; this is the future of programming.

At the top of the Composition Editor is the toolbar. It has tools for laying out and aligning parts on the workspace. To the left of the workspace is the Parts Palette. The left side of the palette has a category list and the right side has specific parts within each category. The bottom of the window has the status line. Click on a part, a connection, or the Parts Palette, and descriptive text is displayed on the status line. To the right of the status line are three buttons for the editor selector.

To create our editor, we'll want to modify the application that was generated by Project Smarts. For the main window, Project Smarts creates an **IFrameWindow** part with a client area composed of an **ICanvas**. However, if you plan on allowing your users to resize the main window, you should almost always use an **IMulticellCanvas**. A multicell canvas has many useful features that make resizing almost automatic. For example, you can align your controls on the multicell canvas's grid and tell the canvas which rows and columns are expandable. Then, when the user resizes the window, only certain controls (such as multiline entry fields and list boxes) will grow and shrink while other controls (such as buttons and icons) will maintain their size and shape.

If you tried to delete the **ICanvas** client area right now, you'd also delete the **Open**, **Close**, and **Help** buttons because they are placed on top of the canvas. We want to keep the **Close** and **Help** buttons, so let's save them temporarily. Select the **Cancel** button and move it off the Frame Window. Select the **Help** button and move it off the Frame Window.

(Note that Composition Editor follows IBM's CUA '91 rules for object selection and manipulation.) To select an object, click once with the left mouse button (the name of the object will appear in the status window at the bottom). To move

Bugs And Fixes

VisualAge C++ is a complex product, which is revealed in the number of bugs that have been discovered in it. For a complete list of fixes, check out IBM's FTP site at <ftp://ftp.software.ibm.com/ps/products/visualagecpp/fixes/v30>.

an object, drag with the right mouse button. To open the pop-up menu for an object, click once with the right mouse button.

Now we want to delete the **ICanvas** from the client area and make the client area a multicell canvas instead. Select the canvas by clicking below the Frame Window title bar but above the **OK** button (the status line should say "Canvas1 selected"). Then, open its pop-up menu and select **Delete**. The client area of the Frame Window should now say "No Client Currently Assigned."

On the left side of the Parts Palette, select the sixth folder down—it has a picture of a folder with an empty window. The status line should say "Category: Composers." On the right side of the Parts Palette, select the first button. The status line should say "Part: IMulticellCanvas*." Click the mouse anywhere within the client area of Frame Window. You should now see a grid in the client area—this is your multicell canvas.

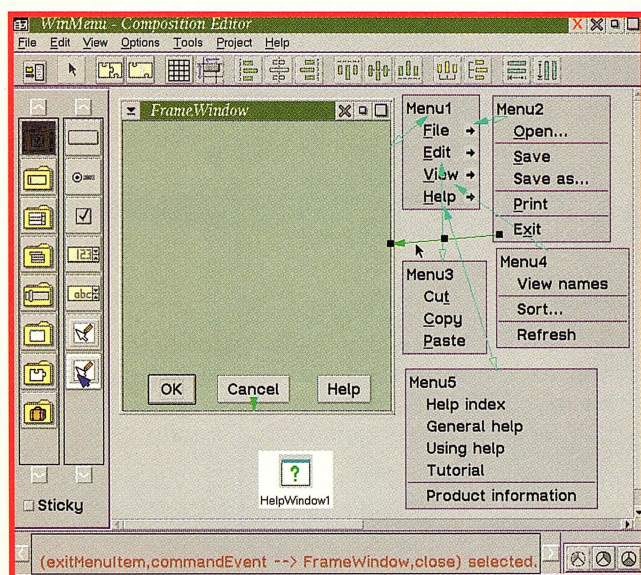


Figure 2: The Composition Editor has a large workspace, a toolbar on top, a Parts Palette on the left, and a status line on the bottom.

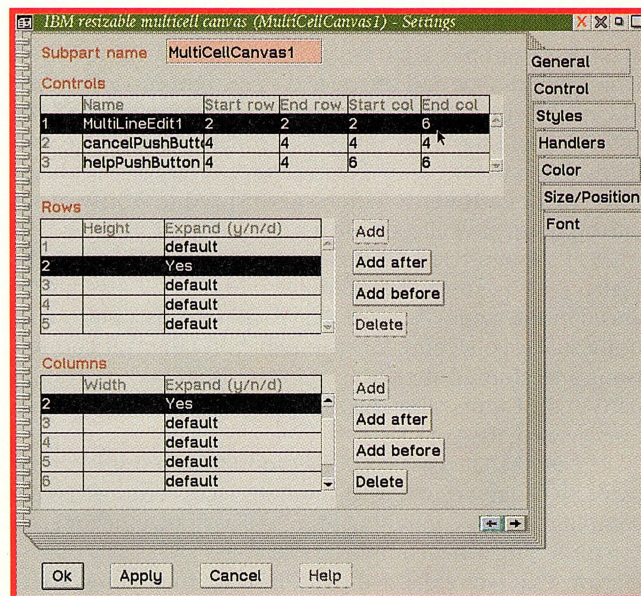


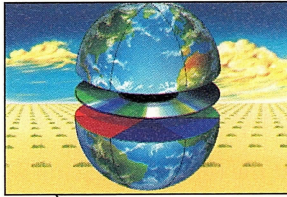
Figure 3: The Settings notebook for a multicell canvas lets you specify the size and expandability of parts you've placed on it.

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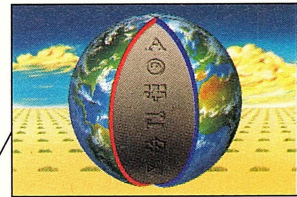
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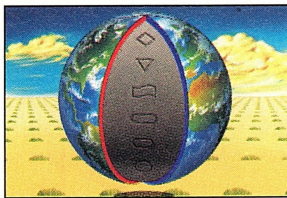
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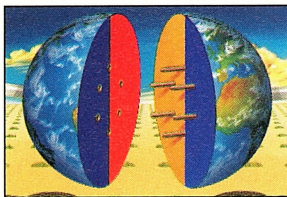
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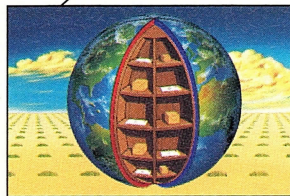
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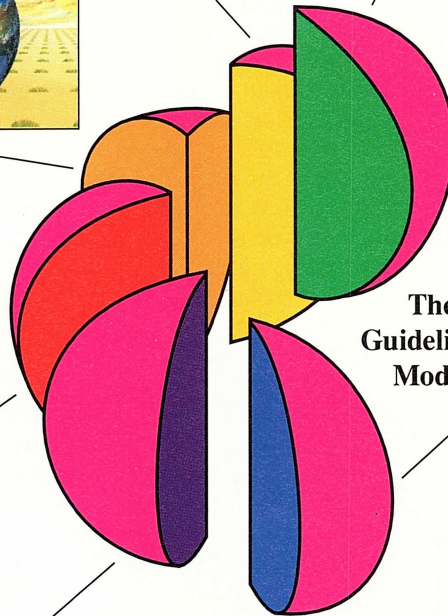
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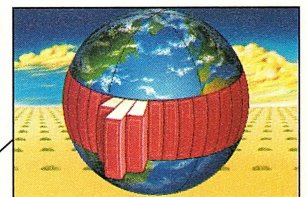
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To create our simple editor, we need to have a multiline edit (MLE) control. On the left side of the Parts Palette, select the second button (Data Entry). On the right side, select the third button, an MLE. Click your mouse pointer inside the second row of the second column of the multicell canvas to place the MLE there. Drag the **Cancel** button to the fourth row, fourth column of the multicell canvas (make sure the center of the mouse pointer is in the specified row and column when you release the mouse button). Drag the **Help** button to row 4, column 6—notice how it adds an extra column automatically.

Settings and connections

You're probably wondering about the odd spacing of the MLE and buttons. If multicell canvases are so great, why doesn't the MLE automatically fill up most of the window? It can—all you have to do is give it a little information.

Double-click on one of the unused areas of the multicell canvas (or bring up its pop-up menu and select **Open Settings**) to bring up its Settings notebook (Figure 3). This notebook lets you change attributes of parts, such as style, size, and font.

The General page of the multicell canvas's Settings notebook has four sections: Subpart name, Controls,

Rows, and Columns. Each control that you dropped onto the canvas is displayed in the Controls section, and the number (and properties) of rows and columns are in the Rows and Columns sections.

You should always have an extra row and column around each part you place on a canvas to use as a border: To the right of the Columns table, click **Add**; this adds a seventh column. You also want the MLE to be the full width of the window, so in the Controls section type "6" into the End Column for **MultilineEdit1**; that spreads the MLE out horizontally.

Now what you want to do is make the MLE expand automatically whenever the Frame Window is resized by your user. For example, when the user makes your application window wider and taller, you want the MLE to expand to fill the space; you don't want the buttons to grow taller or wider. To do that, you have to make at least one column and one row **Expandable**. In the Rows table and the Columns table you can enter "Y" under **Expand** to make any row expandable. The question is: Which row and which column? Since the MLE spans columns two through six, you can make any one of those columns expandable. But watch out for unintended side effects: if you make Column 4 expandable, then the **Cancel** push button will also expand—this is probably not what you want. Your best bet is to make Column 2 expandable, since no other control is placed there. And because the MLE is the only control on row two, you can make row two expandable. Just go to Column 2 in the table and change the "d" to "y" and then do the same for Row 2. Your Settings notebook should now look like Figure 3.

Now that the window looks the way we want it to, let's add some connections. There are a bunch of menus on the right, but only the **File→Exit** item is already connected. Since we have an MLE, why don't we hook up the **Cut**, **Copy**, and **Paste** menu items.

Right click on **Menu3's Cut** item to bring up its pop-up menu. To connect parts, we'll want to get to the **Connection** menu, so click on it. If you're familiar with PM programming, you know that selecting a menu item generates a command event. In IBM's Open Class Library, that's known as a

commandEvent object. Selecting **commandEvent** on the **Connection** menu will let us hook into this event, so select it now. The mouse pointer turns into a spider-like object; click on the MLE, and this will bring up the MLE's **Connection** menu automatically. Conveniently, there's a **Cut** item on that menu—select it to connect to it.

What you have now is a connection between **Menu3's Cut** item and the MLE: when the user selects the **Cut** menu item, a **commandEvent** is generated. You have just told the MLE to perform a cut operation when it receives that **commandEvent**. This is called a connection and is represented by an arrow. A connection, like a part, is an object, and you can select connections and bring up a pop-up menu to edit them.

Adding connections for **Copy** and **Paste** is equally easy. A quick way to pop-up the **Connection** menu is to hold down the <Alt> key and press the right mouse button over the object. Try that now on the **Copy** item on **Menu3**. Then select **commandEvent**, click the spider on the MLE, and select **Copy**. Do the same for **Paste**.

Now let's test the application. To save your part, click the first button on the toolbar. That will save the part and generate source code automatically. Because the Composition Editor knows about your project, just select **Project→Build** from the menu bar to build your project. When the build is complete, select **Project→Run** to run it.

Resize your application, press the maximize button, and then resize it again. Notice that the multicell canvas is doing its job: the MLE expands and contracts to fill most of the client area, with room left over on the bottom right for the **Cancel** and **Help** buttons, which always stay the same size. Pretty nice, eh?

Test the menus you connected to the MLE by entering text, selecting it, and trying **Edit→Cut**, **Edit→Copy**, and **Edit→Paste**. You can even use the accelerator keys (<Ctrl+Del>, <Ctrl+Ins>, and <Shift+Ins>), and you didn't have to write any code for that.

While all of those features are pretty slick, you may be thinking that Visual Builder doesn't really bring anything new to the table, since application generators are a dime a dozen these days. That would certainly be true

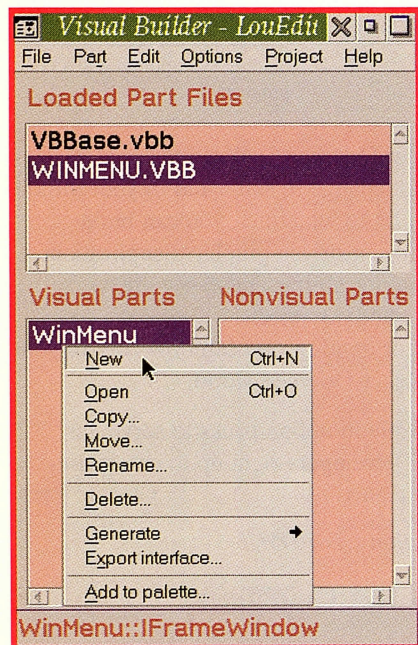


Figure 4: To create a new part, press the right mouse button to bring up a pop-up menu in Visual Builder's parts lists.

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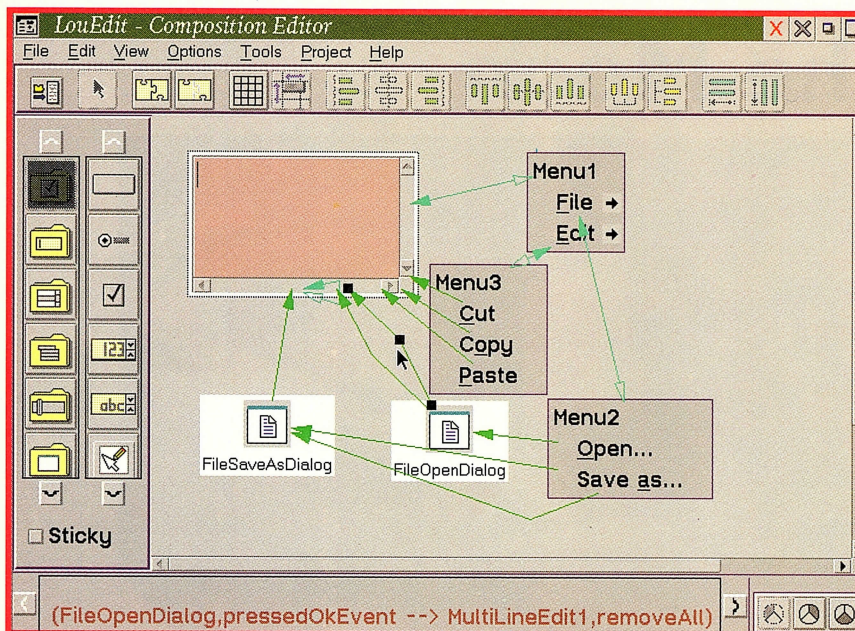


Figure 5: After you've made your connections, your editor part should look something like this one.

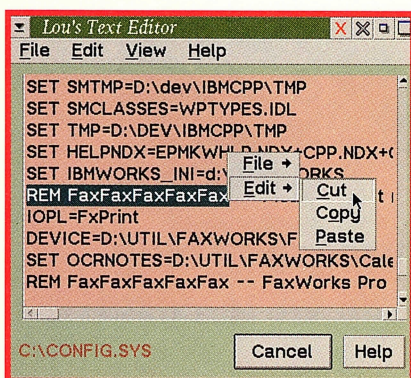


Figure 6: When you build and run your editor, it will look like this one with a file loaded.

if we stopped here. But the beauty of Visual Builder is about to be uncovered.

Creating custom parts

Sure, hooking up cut/copy/paste to an MLE with a few mouse clicks is convenient, but why bother repeating that every time you want a text editor in your apps? It would be easier if you could create your own part that had menus built into it and that could load and save files by itself. That way, when you're creating new applications, you could just drag and drop this part into your new app, and the menus and open/save dialogs would already be built in.

No problem. Let's do it now!

We're going to create a **LouEdit** part that lets us load, edit, and save files. Go back into the Visual Builder main window, right-click inside the **Visual Parts**

list box (Figure 4) and select **New**. This is how you create new parts. For **Class Name**, enter "LouEdit." Enter "Lou's file viewer/editor" next to **Description**; "louedit.vbb" for File name; select **Visual Part** next to **Part Type**; and type **IMultiLineEdit** for base class. (Note that the combobox lets you select any of the suggested parts, or you can type in the name of any other part that you want to derive from.)

This last item is important. The **WinMenu** part that we were editing before had a base class of **IFrameWindow**, which meant it had all the features of a frame window—title bar, minimize and maximize buttons, system menu, and a resizable border. For our new **LouEdit** part, however, we don't want a frame window. What we want is more like a custom control that's similar to a multiline edit control. In that case, an **IMultiLineEdit** makes a better base class.

Click **Open** to create the part and open it in the Composition Editor. What you start out with is an **IMultiLineEdit** part that you can now modify to create your custom part. Select it with the mouse and resize it so it's much smaller; we're going to need more working space around it.

To give our editor horizontal and vertical scrollbars, we need to change the MLE's styles. Double-click on the MLE and go to the **Styles** page. Turn on both scrollbars by clicking in the **On**

column. You'll also probably want to turn **WordWrap** to **Off**. Click **OK** to dismiss the settings dialog.

Now let's add the menus for opening and saving files, as well as cut/copy/paste. Select the **Frame Extensions** category (the fourth folder down) and an **IMenu** on the Parts Palette. Drop the **IMenu** outside your canvas/MLE. Select an **IMenuCascade** part from the Parts Palette and drop it on the **Menu1** item you just created. Repeat this step once.

Edit **MenuCascade1** by holding down the <Alt> key and clicking once with the left mouse button; type in "~File" and click the mouse outside the editing area to stop editing. Do the same for **MenuCascade2**, typing in "~Edit" instead. Now bring up the MLE's **Connection** menu and select "menu;" click the mouse on **Menu1** and select "this." This will bring up **Menu1** when a user requests a menu (by right clicking in the MLE). The tilde indicates the single-letter keyboard shortcut.

Use the Parts Palette to create another **IMenu**, this time with two **IMenuItems** named "~Open..." and "Save ~as...". Hook up **Menu2** to **Menu1**'s **File** item using its **Connection** menu. Create a third **IMenu** with three **IMenuItems**: "~Cut," "C~opy," and "~Paste." Hook up **Menu3** to **Menu1**'s **Edit** item using its **Connection** menu.

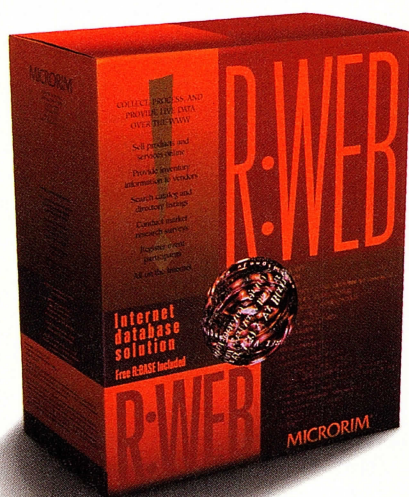
Now that we have the menus set up, let's make them do something when they're clicked. Just as we did with the **WinMenu** part, connect **Menu3**'s cut/copy/paste items' **commandEvents** to the MLE's cut, copy, and paste **Connection** menu items. When you're finished, all of **Menu3**'s items should be hooked up. All that's left now is to hook up **open** and **save** as dialogs.

Active dialog

It's easy to hook up your code to standard OS/2 dialog boxes. The final category on the Parts Palette is appropriately called **Other** and includes dialogs and message boxes. Select the **IVBFileDialog*** part and place it on your workspace, away from other user interface (UI) objects.

IVBFileDialog is a nonvisual part. Even though a **File Open** dialog is clearly a UI object, you can't modify its layout in the Composition Editor, so

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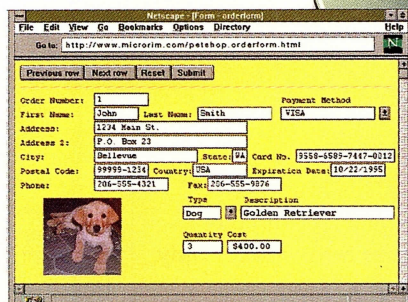
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consider it nonvisual. Nonvisual parts can still send and respond to events.

<Alt> and click on the dialog object and change its name to "FileOpenDialog." Then connect **commandEvent** on **Menu2's Open** item to the **showModally** action on **FileOpenDialog**. We want to clear out the MLE whenever the user opens a new file, so connect the dialog's **pressedOkEvent** to the MLE's **removeAll** action. When the user selects a file and clicks **OK**, **FileOpenDialog's** filename attribute will change, so connect its filename attribute to the MLE's **importFromFile** action. Double-click the **FileOpenDialog** part and enter "Open a text file" under **Title**, "*.txt" under **Filename**, and "~Open" under **OK Button Text**.

Use the Parts Palette to place another **IVBFileDialog** onto the workspace, this time renaming it "FileSaveAsDialog." The only difference here is that we need to tell **IVBFileDialog** that we want a **SaveAs** dialog rather than an **Open** dialog. So first (the order of connections is important) connect the **commandEvent** on **Menu2's SaveAs**

item to the **setSaveAsDialog** action on **FileSaveAsDialog**. Only then should you connect **commandEvent** on **Menu2's SaveAs** item on **Menu2** to the **showModally** action and then connect the filename attribute to the MLE's **exportToFile** action. Open the settings for **FileSaveAsDialog**, and enter "Save as a text file" under **Title**, "file.txt" under **Filename**, and "Save ~as" under **OK Button Text**. Your almost-finished product should look like Figure 5.

Finally, a promotion

Before we use this **LouEdit** part with other parts, there's one last step: *Promotion*.

The concept of promotion is similar to C++'s concept of private vs. public data and functions. Remember that when we created **LouEdit**, we inherited from **IMultiLineEdit**. Then we added a bunch of functionality to it. But as far as its public interface is concerned, **LouEdit** is just an **IMultiLineEdit** and has only those actions, attributes, and events. To effectively use **LouEdit** with other parts, we need to

promote—or make public—certain features so that other parts can access them.

We'll want other parts to be able to know when the current filename changes, so first promote the dialogs' filename attributes. Right-click on **FileOpenDialog** and select **Promote Part Feature**, select **filename** under attribute, and click **Promote**. Close the dialog. Repeat for the **FileSaveAsDialog**.

You can also make features *preferred*. A preferred feature appears on the part's **Connection** menu; other features only appear when you select **More** from the **Connection** menu. On the lower right corner of the Composition Editor window are three icons; click the third to switch to the Part Interface Editor. Click on the **Preferred** tab, then click on **fileOpenDialogFileName** under **Attributes**. Click the **Add>>** button; it should now appear under **Preferred Features**. Repeat this for the other features you promoted. Click on the first of the three icons on the bottom right to return to the Composition Editor.

We're nearly done. Click on the first

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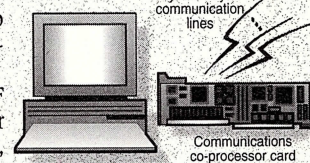
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icon in the toolbar to save our **LouEdit** part and generate source code. Our **LouEdit** part is now a real, stand-alone part that you can give other people to use. In fact, it's posted on my web page (see the end of this article for its location), and you can download it and use it yourself. Just go into the Visual Builder and select **File→Load** to use it, then **Part→Generate→Part Source** to create the source code.

Using the part

Let's try our new part in our **WinMenu** demonstration program. First, open the **WinMenu** part in the Composition Editor. Add the part to the part palette as follows: **Options→Modify Palette→Add new part**, type in "LouEdit", select **Data Entry**, and click **Add**.

Drag the MLE off the multicell canvas and drop it on the workspace background. Drop **LouEdit** into row two, column two of the canvas, then open the canvas's settings and change **LouEdit1** to end at column six. Drag the arrows from the **Cut/Copy/Paste** menus from the MLE onto the **Lou-**

Edit part and select the appropriate connection item. Right-click on the MLE and select **Delete**.

You can display the filename by taking advantage of the attributes you promoted and sending them to a static text field. Drop an **IStaticText*** part into row four, column two of the canvas and connect **LouEdit's fileOpenDialogFileName** attribute with the static text's **Text** attribute. Repeat with the **fileSaveAsDialogFileName** attribute.

Save the modified **WinMenu** part by clicking the **Save & Generate** button on the toolbar. To generate the app, select **Project→Build→Build Normal**, then **Project→LouEditor (Visual Builder)** to bring the project to the foreground. When the build completes, click the **Run** button to run it. Voila! It should look like Figure 6.

Keep exploring

IBM's Visual Builder is a powerful, complex tool that can produce impressive results in a short time. We've just skimmed the surface. More help is available by selecting **Help→Visual Programming** from the Composition

Editor's menu. In a short period of time, you and your firm can be creating robust, reusable parts that used to take months of development. By creating corporate-wide standardized parts, you can dramatically reduce coding time for your programming team, and at the same time reduce learning time for your end users. It's a real-world combination that's hard to beat.

As we go to press, I just had the opportunity to use the beta version of VisualAge C++ for Windows 95 and NT. I loaded my *LouEdit.vbb* part—unchanged—into the Windows version of Visual Builder, generated source code, compiled, and linked. It worked flawlessly! So now you can add cross-platform application generation for Windows to VisualAge C++'s other great features. **OS/2**

Lou Miranda was a contributing author to OS/2 Warp Administrator's Survival Guide from Sams Publishing. For more tips on OS/2 and VisualAge C++, visit his Virtual Pundit web page at <http://www.mirandacorp.com>.

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Moving Mainframe User Interfaces

Don't get stuck in the middle. By Harris Kravatz

Many companies today are moving mainframe applications to the workstation. Whether moving all or only a portion of the application, one part that is usually relocated is the user interface. How do you move from a character-based, function-oriented mainframe user interface to an OS/2 object-oriented user interface? This article demonstrates this process through the redesign of a mainframe Problem Reporting System user interface for the OS/2 environment.

Scenario: Your boss walks into your office and says he wants you to move your current Problem Reporting System (PRS)—the one that's been around since you were in grade school—from the mainframe to OS/2. So you take the popular GUI Builder course, and you're ready to go. You pull out your stack of mainframe **Problem Reporting** screens: not too bad—there are only seven. The first screen is the Problem Reporting System Main Menu (Figure 1). The second screen is the **Create a Problem Report** screen (Figure 2). The rest of the screens are similar to the **Create** screen and are not repeated here.

Mainframe Mapping

The design approach often taken at this point is one that I call Mainframe Mapping. This approach begins with the mainframe screens and maps each mainframe user interface component to a corresponding GUI control. For example, if your mainframe screen contains an entry field, it would map to (that is, be replaced by) an entry field or combo box on the GUI window. A selection list would map to a list box or set of radio buttons. Function keys, in turn, would map to push buttons.

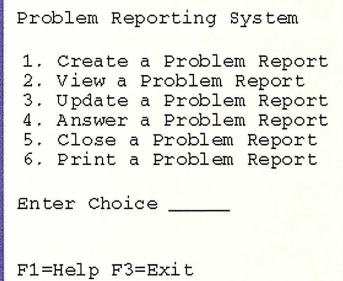
To launch the application, an icon for the PRS is created and placed on the OS/2 desktop. Double-clicking on it displays the PRS main menu. The design created by following this approach may look like Figure 3.

As you can see, a **Problem Report Options** group box, containing radio buttons for the application actions, replaces the mainframe main menu. The **OK** push button replaces the <Enter> key. **Help** and **Exit** push buttons replace the F1 and F3 function keys, respectively.

Mapping the **Create a Problem Report** screen may yield

a window similar to that in Figure 4, where a **Status** read-only entry field replaces the mainframe **Status** output-only field. **Number** and **Date** read-only entry fields replace their mainframe equivalents. **Reported By** and **Severity** drop-down lists replace the mainframe **Reported By** and **Severity** entry fields. Multiline entry fields replace the three-line entry areas. The mainframe **Module** entry field has been replaced with an entry field and associated **Module List** push button, which displays a list of modules from which to choose. The **OK** push button replaces the <Enter> key. **Print**, **Close Problem**, **Exit**, and **Help** push buttons replace the functions keys: F1=Help, F3=Exit, F5=Close a Problem, and F6=Print.

This approach provides some user benefits. Previously, the user had to type in his name each time he opened or answered a problem. In the GUI, the **Reported By** drop-down is automatically populated with the logged-on user's name, and it also allows the user



```

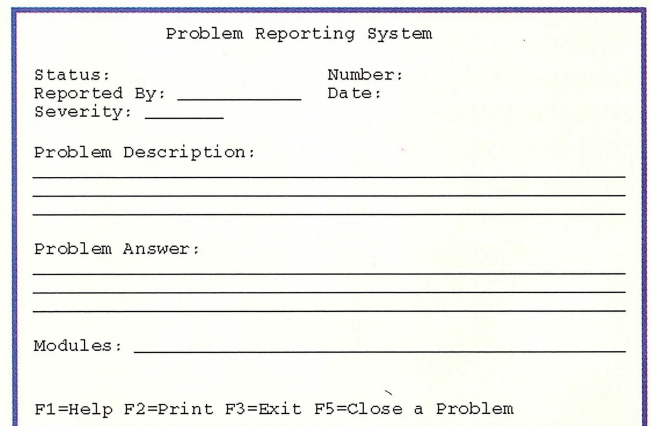
Problem Reporting System

1. Create a Problem Report
2. View a Problem Report
3. Update a Problem Report
4. Answer a Problem Report
5. Close a Problem Report
6. Print a Problem Report

Enter Choice ____

F1=Help F3=Exit
    
```

Figure 1. Problem Reporting System Main Menu.



```

Problem Reporting System

Status: _____ Number: _____
Reported By: _____ Date: _____
Severity: _____

Problem Description:
_____  

_____  

_____

Problem Answer:
_____  

_____  

_____

Modules: _____

F1=Help F2=Print F3=Exit F5=Close a Problem
    
```

Figure 2. Create a Problem Report screen.



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Visual Builder

VisualAge C++ Visual Builder is based on the popular IBM VisualAge for Smalltalk. Users construct their user interface using reusable "parts," and then generate C++ code, which IBM's compiler can then optimize, producing executables of considerable speed while cutting down on GUI development time.

Visual Editor

*The Editor and most other tools are highly integrated with the VisualAge C++ information. If you highlight a language token, such as an IBM Open Class name in the Editor, and type **Ctrl+H**, the documentation for that class will be displayed. In addition, the VisualAge C++ online help and documentation are available from all of its help pull downs, so you can get information anywhere you need it.*

If a build has a compile error, the user simply clicks on the error in the project's monitor area. The Editor opens at the appropriate place with the error embedded in place.

Article Note:

This article is an excerpt from "Getting Started with VisualAge C++" published in Volume 8 of The Developer Connection News and written by John Robertson. John is a Human Factors Engineer in IBM's Toronto Laboratory User Centered Product Design area. The original article along with the other back issues of The Developer Connection News can be found on the DevCon CDs.



Building a Production Application with VisualAge C++

Let's walk through the creation of an application using VisualAge C++ 3.0, from the initial code to the production of the finalized application. This example uses a GUI-based, data-access application. The first step is the creation of the project. Using Project Smarts, select a Visual Builder application. This option creates the project and also the initial Visual Builder "part" that you'll use to create the customized GUI. When the Project Smarts tool has completed its work, you have a project folder.

Opening the project, you see a single file—the Visual Builder Part. The first step is to define the user interface. Open the part by double-clicking, or select **Visual** from the pop-up or the **Selected** menu, to activate the Visual Builder and load the part. Once the part is open, you'll see that Project Smarts has done a great deal of the work. The project now contains a frame window part, complete with canvas, menu bar, standard menu pull downs, some push buttons, and standard help functions (a help window is also enabled). For simple GUI applications like this one, you will usually not need to do much more than customize the menu bar and the client area for your application's special needs.

To add user interface parts to the application, drag parts from the part palettes to the appropriate place in the Composition Editor. Everything on the screen is a separate object-oriented part, and customizing the application is simply a matter of changing Settings.

Once the GUI is built with the Visual Builder, you merely generate the C++ code and click on either the **Build** button in the WorkFrame project or select **Build** from the **Project** pull down. The application is compiled and linked. The new integration of the Visual Builder and WorkFrame makes the iterative creation of a GUI simpler than ever before.

The visual aspects of a program are not the only thing that you can create with the Visual Builder. Using the Part Interface Editor and the Class Editor, you can specify the way the parts will behave once they are generated into C++ classes. The Visual Builder also lets you customize more than the visual appearance of an application. By creating non-visual parts, you can define a great deal of the application's "back-end" behavior.

The Data Access Builder

Now let's say you want to access data in a DB2 table with your application. The Data Access Builder lets you create C++ classes or Visual Builder parts that allow access to database tables. Starting the Data Access Builder is simple using WorkFrame, and using it is simple as well. Specifying the table name and the key fields, you create the parts of classes in a graphical building environment, changing settings by pointing at an object (just as you would in the Workplace Shell or with WorkFrame). In this case, you will create a Visual Builder part, which is imported into the Visual Builder as a non-visual part.

The Editor

The VisualAge Editor is a highly customizable, live parsing editor. It formats language elements with colors and fonts for improved readability and error detection. In addition to supporting C and C++, the Editor supports over 20 other languages, and has pre-made key emulations for four other editors.

the Editor, highly customizable, is completely integrated with VisualAge as a whole. The Editor can be launched from any tool whenever text

editing or display is appropriate. It is closely tied with the project's monitor pane, and lets you double-click on any compiler error to be taken right to the error in the appropriate file. Similarly, while in the debugger, double-clicking on white space in any source view will take you from the debugger to the Editor.

Once you have built your application and it is compiling without errors, you can run it by double-clicking on the executable object. If the executable requires debugging, compiling for debugging is simple. Rather than dealing with individual compiler flags, you can compile for debug by choosing the **Compilation for Debug** option in the Build Smarts of the project and then clicking on the **Build** button. All of the common compile options are available in Build Smarts, including debugging, browsing, profiling, and optimization. To manipulate the individual compiler flags, change the settings in the compiler and linker actions (much like C Set++ Version 2.0).

The Debugger

Selecting **Debug** from the executable object's pop-up launches the VisualAge Debugger, a powerful multi-threaded debugger for OS/2 applications. The VisualAge Debugger is more powerful than ever, offering multiple views of a program in execution, with a unique notebook-like view for multiple source files.

The Browser

Users of C Set++'s Browser will be pleasantly surprised with the improvements in the VisualAge C++ Browser. In addition to supporting quick parsing of files not compiled for the Browser, the Browser has a simpler, more object-oriented user interface that lets you browse classes or functions via their pop-up menus. The Browser also comes pre-configured to browse the Class Libraries that come with VisualAge C++, so the libraries are easier to understand than ever before.

The Performance Analyzer

Using the VisualAge Performance Analyzer, you can examine your program's execution in detail. It monitors executables at run time, generating execution traces. You can view these traces in any of five graphical views that highlight the inner workings of the program. You can see which modules/functions use up most CPU time and the exact sequence of program execution and thread switching.

Once you're satisfied with your application and its performance, use Build Smarts to build and produce the final executable code.

Conclusion

VisualAge C++'s integration of visual building, integrated tools, increased usability, and IBM's world-class compiler and class libraries make VisualAge C++ the ideal platform for OS/2 development. Whether you are maintaining a current set of OS/2 applications or starting from scratch, VisualAge C++ provides excellent support for you, and quickly gets you set up and productive. ♦

Volume 10 of DevCon features a demo version of VisualAge C++ 3.0. For a complete list of products on the CDs see our home page:

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Mainframe UI

to choose another person's name from the list. The **Severity** drop-down list provides a list of problem severities from which to choose; previously, the user had to type in a severity code.

The multiline entry fields that have replaced the three-line entry areas allow the user to enter all

the information needed to describe the problem. On the mainframe, users often exhausted the three-line limit before entering all the information, thereby forcing them to retype the information using abbreviations. As a result, the person fixing the problem often had trouble understanding the explanation of the problem.

The **Module List** push button displays a multiple selection list of modules. Selecting the modified modules enters them into the **Modules** entry field. On the mainframe, the user had to type in the module names.

What about objects?

Our design improves the usability of the PRS application, and user productivity has increased, to some extent. However, the mainframe interface has simply been reimplemented on a workstation. What about all this talk of object-oriented user interfaces using real-world objects? What about drag and drop? How do you go from a mainframe application user interface to an object-oriented user interface?

The first step is to start with the users of the application, not the mainframe screens. Emulating the mainframe application on a workstation provides users with a nice GUI on an outdated application. By starting with the users, you can determine their needs and design a PRS that satisfies their needs.

Once you identify the users, talk to them. Observe them using the system. Ask the users what they like and don't like about the system. Make sure you talk to the real users of the system. Real users are those people who use the system on a daily basis—not supervisors or people who "used to be users." By talking with and observing the users of the PRS, we found out the following:

- Users would like to see a list of all problems and be able to tailor the list to show only opened, answered, or closed problems.
- Users would like to see how long a problem has been open.

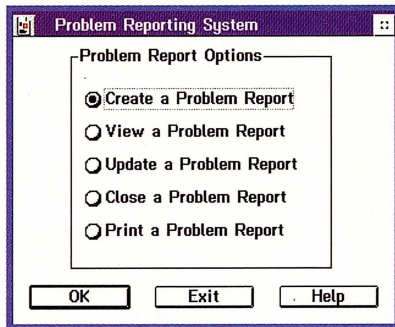


Figure 3. Problem Reporting System Main Menu.

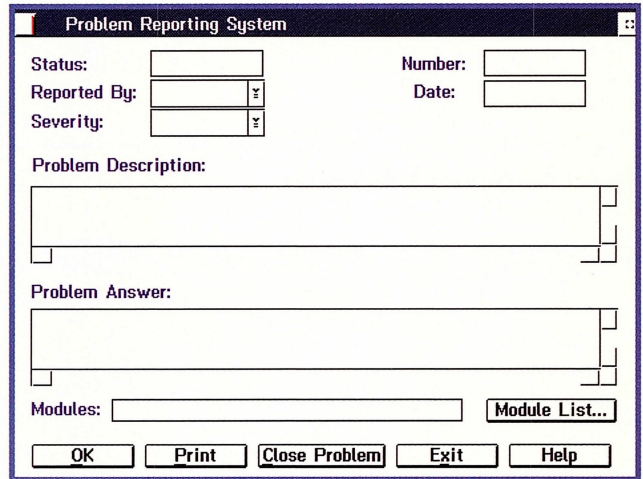


Figure 4. Problem Reporting System—Create a Problem Report window.

- The person who opened the problem would like to see who answered the problem.
- Users want only the opener to be able to close a problem. Today, either the opener or the answerer can close a problem.
- Other requirements included those problems that were addressed by the first GUI design.

The next step, of primary importance in the design of object-oriented user interfaces, is to identify the user objects and the actions performed on those objects.

The results of our PRS user study and task analysis is shown in Table 1.

(Note: The process for identifying objects and actions is beyond the scope of this article. This process is taught in the course, "Designing Object-Oriented User Interfaces" and is documented in *Object-Oriented Interface Design, IBM Common User Access Guidelines*, ISBN 1-56529-170-0.)

In the object-oriented environment, users create new objects using template objects (or from existing objects of the same type). Figure 5 shows the **Templates** folder containing the **Problem Report** template, along with the **Problems Reports** folder. Dragging and dropping the **Problem Report**

Table 1: PRS user objects and actions.

Objects	Type	Actions
Problem Reports	Data	Open, Answer, Close, Print
Problem Reports Folder	Container	Show as Icons, Details Print View by opened, answered, closed, opener, answerer, aging Sort Find
Printer	Device	

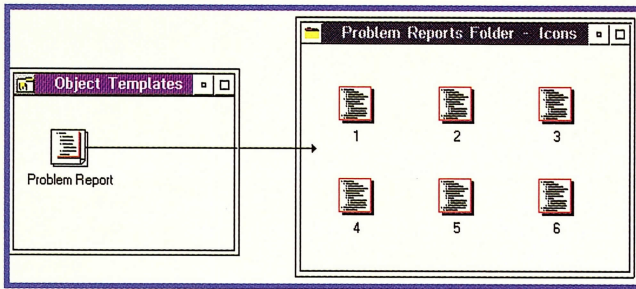


Figure 5. Creating a new Problem Report.

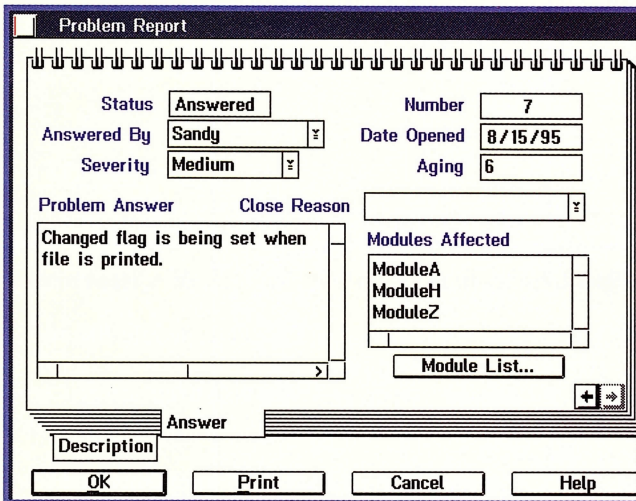


Figure 7: Problem Report Notebook—Answer Page.

template onto the **Problem Reports** folder creates a new problem report and opens the **Problem Report** notebook (Figure 6).

The Problem Report notebook contains two pages: one for describing the problem and one for answering the problem. The description page is shown in Figure 6. It contains **Status**, **Number**, and **Date Opened** read-only fields; an **Opened By** drop-down list (prefilled with the signed-on user's name); and a **Severity** drop-down list. An **Aging** read-only field has also been added to address the need to see how long a problem has been open. Below the Aging field is a **Close Reason** drop-down list, to select why a problem was closed (for example, Fixed, Unreproducible, Fix in next version). As part of the design of this notebook, only the person who opened the problem can close it. This function is provided by disabling the **Close Reason** drop-down for anyone but the opener of the problem. The user enters the problem in the **Problem Description** multiline entry field.

page. However, in place of the **Opened By** drop-down list is an **Answered By** drop-down. The answer page also contains a **Modules Affected** list box and a **Modules List** push button. Selecting this push button displays a window containing a multiselect list of modules. Selecting the modified modules enters them into the **Modules Affected** list box.

Figure 8 shows the **Problem Reports** folder in **Details** view. The user can sort by the different fields or show only opened, answered, or closed problems, or problems opened or answered by a specific person. In either **Icon** or **Details** view, the user can drag a problem report object and drop it on the printer to print an individual problem report. The user has the option of printing all of the problems in the **Problems** folder or a tailored list. **Details** view is displayed by selecting a pop-up or pull-down menu choice (not shown).

Conclusion

When moving a mainframe user interface to the workstation, don't get stuck

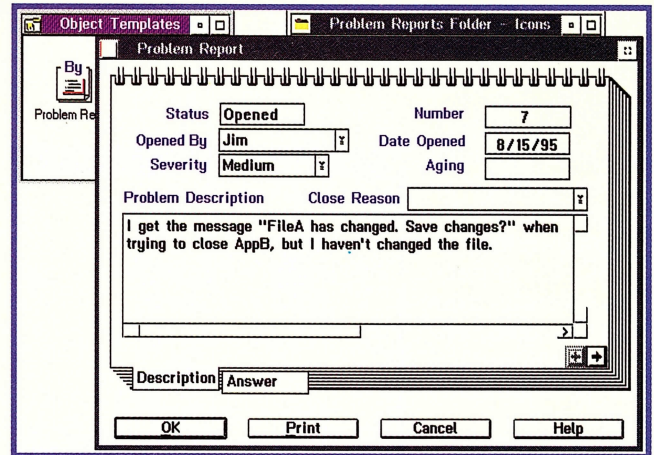


Figure 6. Problem Report Notebook—Description Page.

Icon	Problem	Status	Close Reason	Opened By	Answered By	Date	Severity	Aging
[Icon]	1	Closed	Fixed	Ralph	Jim	8/10/95	High	3
[Icon]	2	Opened		Jeff		8/11/95	Low	23
[Icon]	3	Answered		Ann	Jeff	8/12/95	Medium	7
[Icon]	4	Answered		Ralph	Sandy	8/14/95	High	4
[Icon]	5	Closed	Fixed	Sandy	Jeff	8/14/95	High	2
[Icon]	6	Opened		Jim		8/15/95	Suggest	17

Figure 8: Problem Reports Folder in Details View.

in the middle. Start with the users of the application and design an object-oriented user interface that serves their needs. Your users will be happier, and you'll have fun doing it. **OS/2**

References

Designing Object-Oriented User Interfaces, HK Interface Design Inc., Boca Raton, Fla.

Object-Oriented Interface Design, IBM Common User Access Guidelines, ISBN 1-56529-170-0, Que, Carmel, Ind., December, 1992.

Harris Kravatz is a GUI design consultant and instructor and president of HK Interface Design, located in Boca Raton, Fla. He specializes in the design of user interfaces for mission critical client/server applications and is the co-author of the IBM CUA Basic and Advanced Interface Design Guides. Harris can be reached at kravatz@ibm.net.

The GUI and OOUI windows shown were created using Techbridge Builder for OS/2, Techbridge Technology Corp., Ottawa, Ont., Canada.

Metaclass and the Dogs of Shakespeare

BY ROGER SESSIONS



In my February column on polymorphism I explained why littleDogs go “woof woof” and bigDogs go “Woof Woof Woof Woof” (OS/2 Magazine, p. 46). Implicit in this discussion was that all dogs bark when asked, and the only difference between the types of dogs is the nature of that bark. I showed how the code:

```
_bark(Lassie, ev)
```

generates the bigDog bark (“Woof Woof Woof Woof”), while the code:

```
_bark(Toto, ev)
```

generates the littleDog bark (“woof woof”).

However, I was recently reading Shakespeare, and it occurred to me that I made an error in that column. I believe in admitting my mistakes, so here is an attempt to set the record straight.

The line that made me rethink my analysis of littleDogs was this line, spoken by King Lear: “The little dogs and all, Tray, Blanch, and Sweet-heart, see, they bark at me.” In order to see why this line caused me such vexation, we must translate it from Shakespearean English into a more familiar language, namely SOM with the C bindings. The SOM C translation of it is:

```
King KingLear;
littleDog Tray, Blanch,
    Sweetheart;
/* ... */
_enter(KingLear, ev);
_lookAt(Tray, ev);
_lookAt(Blanch, ev);
_lookAt(Sweetheart, ev);
```

resulting in the following output:

**“The little dogs and
all, Tray, Blanch,
and Sweet-heart,
see, they
bark at me.”**

```
woof woof
woof woof
woof woof
```

The problem is that at no point does King Lear ask any of the littleDogs to bark! This fact is quite at odds with the code I showed in February, which would have permitted the littleDogs to bark only if their monarch so requested. With my polymorphic littleDogs, Shakespeare would have had to include these lines in his play to get his desired effect:

```
_bark(Tray, ev);
_bark(Blanch, ev);
_bark(Sweetheart, ev);
```

So, in this column I am going to reimplement littleDogs as they would have been programmed by the Bard himself.

Let's analyze the situation further. Just what did King Lear do to make the

dogs bark? Perhaps he *looked* at the dogs? I believe Shakespeare's intention was that looking at the dogs was merely one example of what King Lear might have done to set off the barking fit. I submit that *anything* King Lear did to the dogs would have had the same result. They would have barked even if King Lear had asked them to roll over!

In other words, these dogs always bark, in addition to doing whatever it is they do. Barking, then, is not associated with the *implementation* of a method, but rather is associated with the *invocation* of a method. How do we program this in SOM?

The answer is to slip into a new mode of programming, one that Ira Forman describes as *metaclass programming*. Ira is one of the SOM developers and great champions of metaclass programming, which he describes as the next major advance in programming languages. As you can see, Ira, similar to all great champions, sometimes gets carried away, but he does raise some interesting issues. I, along with many others, am indebted to him for first explaining the concepts of metaclass programming.

Those of you who have heard Ira's talks will recognize my reimplemented barking dogs as an adaptation of Ira's growling dogs example (which, of course, is an adaptation of my original barking dog, so all's fair).

We can briefly describe metaclass programming as programming not at the object level, but at the class level. It turns out that we are still programming objects, but these are now very special objects—class objects. Let's look more closely at these class objects.

All SOM objects are associated with some class. Knowing that Toto, for example, is instantiated as a littleDog

tells us that the Toto object is associated with the littleDog class.

Every class that is available to a given SOM program has an associated object called the *class object*. If littleDog is derived from dog, and dog from SOMObject (the root of all SOM objects), then a program with instantiated littleDogs will have class objects in its address space for SOMObject, dog, and littleDog.

These class objects are similar to other SOM objects. They must be instantiated, they are associated with a class, they are defined by IDL, and they have associated methods. Many SOM

programmers aren't aware of these class objects, because they are often automatically instantiated. When one executes the statement:

```
Toto = littleDogNew();
```

under the covers, SOM checks to make sure that class objects have been instantiated for littleDog and all of littleDog's base classes. If any class objects haven't already been instantiated, they will be instantiated as part of the execution of littleDogNew.

Several ways exist for getting hold of the class object of a given class. One of the most common is to use the SOM-provided macro `<class>`. In the SOM-generated header file for any class, say, littleDog, is a macro of the form `<class>`. For the littleDog class, this macro would look like `_littleDog`. This macro returns the class object. (In the lit-

Listing 1: barkingClass definition.

```
#include <sombacl.s.idl>

interface barkingClass : SOMMBeforeAfter {
    implementation {
        override : sommBeforeMethod;
    };
};
```

Listing 2: barkingClass implementation.

```
#ifndef SOM_Module_dogcls_Source
#define SOM_Module_dogcls_Source
#endif
#define barkingClass_Class_Source

#include "dogcls.ih"
SOM_Scope boolean SOMLINK sommBeforeMethod(
    barkingClass somSelf,
    Environment *ev,
    SOMObject object,
    somId methodId, va_list ap)
{
    barkingClassMethodDebug("barkingClass", "sommBeforeMethod");
    somPrintf("woof woof\n");
    return
    (barkingClass_parent_SOMMBeforeAfter_sommBeforeMethod(somSelf,
        ev, object, methodId, ap));
}
```

Listing 3: littleDog definition.

```
#include <somobj.idl>
#include <dogcls.idl>

interface littleDog : SOMObject {
    void lookAt();
    void rollOver();
    implementation {
        releaseorder: lookAt, rollOver;
        metaclass = barkingClass;
    };
};
```

tleDog case, the class object returned is the one associated with the littleDog class.)

As with all SOM objects, these class objects are derived ultimately from SOMObject. Therefore, it's safe to call any of the SOMObject methods on class objects. One of the SOMObject methods is `_getClassName`, a method that returns the class of an object. For example, if we invoke `_getClassName` on Toto,

Listing Guide

Listing 1 shows the definition of barkingClass. Notice we have included the SOM-provided file (*sombacl.s*), which defines barkingClass's base class, **SOMMBeforeAfter**. Although **SOMMBeforeAfter** defines both a **sommBeforeMethod** and a **sommAfterMethod**, we are only overriding the **sommBeforeMethod**.

Listing 2 shows the implementation of barkingClass. Most of this file was automatically generated by the SOM precompiler. The only thing we added was the **somPrintf** call which actually does the barking.

Listing 3 shows the definition of littleDog. This definition looks similar to a typical dog definition, except for the addition of the metaclass directive and the inclusion of the file defining the metaclass (*dogcls.idl*). Notice we define two methods, **lookAt** and **rollOver**.

Listing 4 shows the implementation of dog. It's an absolutely standard, run-of-the-mill dog implementation. Notice that in no place in the implementation of these methods is there any barking behavior.

Listing 5 shows the test program. In no place in the test program do we ask Toto to bark.

Listing 6 shows the output, with lines numbered for reference. The first of Toto's barks (line 1) comes as a result of an invisible method call—the **somlnit**—resulting from Toto's instantiation. The second bark (line 4) comes because we looked at Toto. The third bark (line 6) comes because we asked Toto to roll over.

we'll have the string "littleDog" returned. If we invoke this method on **_littleDog**, we will, by default, get the string "SOMClass."

The default class of all class objects is "SOMClass." In fact, the only distinguishing characteristic of class objects is that their class is always either SOMClass or some class derived from SOMClass. As do all classes, SOMClass has a defining IDL with various method declarations. The SOMClass IDL can be found in the SOM-include directory.

Class objects have a lot of interesting behaviors. One of these behaviors is the logic controlling how methods are invoked on objects of their class. It can be modified by changing the implementation of the class object's class.

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Listing 4: littleDog implementation.

```
#ifndef SOM_Module_dog_Source
#define SOM_Module_dog_Source
#endif
#define littleDog_Class_Source
#define littleDogClass_Class_Source

#include "dog.ih"

SOM_Scope void SOMLINK lookAt(littleDog somSelf, Environment *ev)
{
    somPrintf("Who is looking at me?\n");
}

SOM_Scope void SOMLINK rollOver(littleDog somSelf, Environment *ev)
{
    somPrintf("Watch me roll over.\n");
}
```

Listing 5: Test program.

```
#include <dog.h>
void main()
{
    littleDog toto;
    Environment *ev;

    toto = littleDogNew();
    somPrintf("Toto instantiated\n\n");

    _lookAt(toto, ev);
    _rollOver(toto, ev);
}
```

Listing 6: Program output.

```
1. woof woof
2. Toto instantiated
3.
4. woof woof
5. Who is looking at me?
6. woof woof
7. Watch me roll over.
```

You can see that the class of a class object is very important. Among other things, the class of a class object controls both method invocation and instantiation. Their invocation implementation is what we need to investigate to implement a Shakespearean version of littleDog.

When we start talking about class objects, language quickly gets in our way. For example, we might say that the invocation of Toto's methods is controlled by the class of Toto's class object, but who understands that? So instead, we shorten it by saying that the class of

Toto's class object is defined to be Toto's *metaclass*. This explanation gives us a much easier statement to contemplate: The invocation of Toto's methods is controlled by Toto's metaclass.

To create our desired littleDog behavior, we need to modify the behavior defined by Toto's metaclass so as to tack in a little something else when invoking a method.

Unfortunately, overriding the method invocation behavior defined by SOMClass is beyond most people's programming ability. But fortunately, SOM has a class derived from SOMClass that provides exactly the hooks we need. This class is called **SOMMBeforeAfter**.

SOMMBeforeAfter is a SOM-provided class that defines two methods: **sommBeforeMethod** and **sommAfterMethod**. It also redefines the method invocation behavior to use the following pseudo-coded algorithm:

```
invoke(methodName,
        targetObject)
{
    _sommBeforeMethod
        (targetObject);
    _methodName(targetObject);
    _sommAfterMethod
        (targetObject);
}
```

In other words, objects whose metaclass is **SOMMBeforeAfter** automatically have the **_sommBeforeMethod** method invoked before every method

invocation and the **_sommAfterMethod** method invoked after every method invocation. All we need to do now is stick our bark behavior into the **sommBeforeMethod** method. Then, our littleDogs will bark before any method invocation.

We accomplish this task by defining a new class, say, **barkingClass**, which is derived from **SOMMBeforeAfter** and overrides **sommBeforeMethod**. Our override implementation will include barking behavior.

Now we only have one conceptual problem left. We said that the default metaclass for all objects is **SOMClass**. How do we tell Toto that his metaclass is our newly defined **barkingClass**? By using a special directive in the dog IDL. This directive is the *metaclass directive*.

Let's summarize our discussion and then look at some sample code.

Every SOM object has an associated class. Every class has an associated class object. We can change the behavior of a whole class of objects by modifying the behavior of the class object. We do this modification by following these steps:

- Deriving a new class from either **SOMClass** or some class derived from **SOMClass**.
- Use the metaclass directive to tell the original class (for example, **littleDog**) that the new class is its metaclass.

As a specific example of this, we created a barking littleDog. We followed these specific steps:

- We derived a new class, **barkingClass**, from **SOMMBeforeAfter**, a SOM-provided class derived from **SOMClass**.
- We overrode the **SOMMBeforeAfter** method, **sommBeforeMethod** to add barking behavior.
- We used the metaclass directive to tell littleDog its metaclass is now **barkingClass**.
- This action changed the class of the littleDog class object to a **barkingClass** rather than a **SOMClass**, which it would have been by default. In other words, the metaclass of littleDogs is changed to **barkingClass**, rather than **SOMClass**.
- This change resulted in the barking behavior automatically being in-

The World of Objects

voked before any method is called on a littleDog object.

Summary

Shakespeare would be very happy with this implementation of littleDog. No matter what King Lear tells these littleDogs to do, they are going to bark first.

We can "meta-program" regardless of which SOM language bindings we use or how we create our SOM objects. It works just as well with distributed objects as with local ones.

We have many possible uses of metaclass programming. We could use it to create a garbage collection scheme that keeps track of which objects are in use. We could use it to tie into a persistence framework that checks if object data needs to be read in from a disk before methods are invoked on the object. We could also use it as a basis for caching objects across address spaces.

Try it, you'll like it. Shakespeare would have. 

References

For more information on metaclass programming, refer to these articles:

Ira R. Forman, Scott H. Danforth, and Hari H. Madduri, 1994. Composition of Before/After Metaclasses in SOM. *OOPSLA '94 Conference Proceedings*, October 23-27 Portland, Oregon.

Scott H. Danforth and Ira R. Forman, 1994. Reflections on Metaclass Programming in SOM. *OOPSLA '94 Conference Proceedings*, October 23-27, Portland, Oregon.

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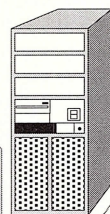
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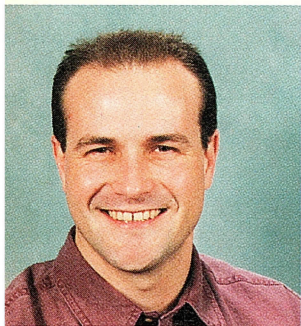
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DBCS: the Double Feature!

BY MARK BENGE AND MATT SMITH

Last month, we shed light on how to enable your applications for double-byte character set (DBCS) on the inside. Now, we'll show you how to enable your OS/2 Presentation Manager applications on the outside.

Most of the work required for making your applications DBCS-aware is internal. The most difficult part is making sure that when you're manipulating the DBCS strings, you're doing it properly.

Oops, the mascara is running...

When we ran an application that was designed for the non-DBCS environment, but was DBCS-aware, we discovered, to our horror, that things didn't look right.

To begin, areas that should show DBCS strings, were either blank or showing gibberish. Some of the dialogues seemed way too large, especially on VGA systems.

We also observed that the font being used was not similar to the System Proportional font with which we are all very familiar.

For example, Figure 1 shows a portion of a dialogue on a non-DBCS system that contains two list boxes. The presentation parameters for the list boxes (PP_FONTNAMESIZE) were set for the Helvetica font at 8 point type (8.Helv).

You can see in the left list box what looks like gibberish. Actually, these are directory names in DBCS characters (Desktop, Nowhere, and Maintenance Desktop). The code page for this dialogue was 437.

Now, even though things look O.K., except for the DBCS strings, you

might expect that when the same dialogue is displayed on a DBCS system, everything would be okey-dokey. Nope!

As you can see in Figure 2, the list boxes look very similar to that in Figure 1. But, what has happened to the DBCS strings? You would think, as we did, that the DBCS strings would display the directory names properly.

Well, the problem here is that the Helvetica font doesn't contain any DBCS characters. You will also notice that the text above the list boxes is slightly different. Herein lies the secret!

Fonts 101—take 2

Being totally baffled and somewhat curious, we told the kitten (yes, there is an addition to the cat family, there are now three) to go exploring and hopefully bring home an offering or two.

Normally, when you don't specify a font for a dialogue or control through presentation parameters (PP_FONTNAMESIZE), the font used within the dialogue is the System Proportional font. This font is the first one listed when you query the font metrics for the system using GpiQueryFonts. On non-DBCS systems, it has an IMatch within the FONTMETRICS of 0.

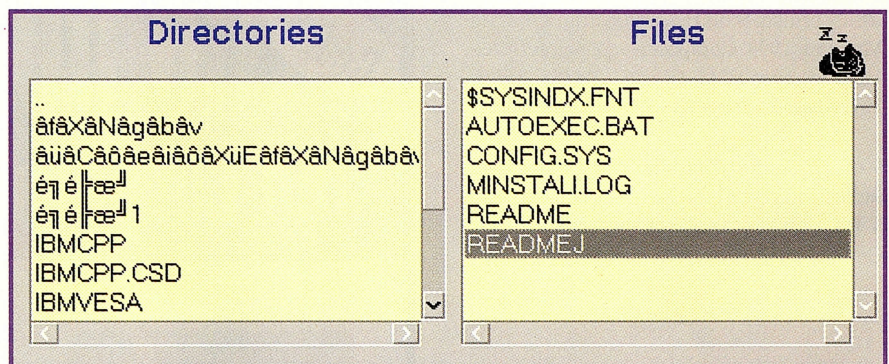


Figure 1: Portion of dialogue containing font presentation parameters on non-DBCS system.

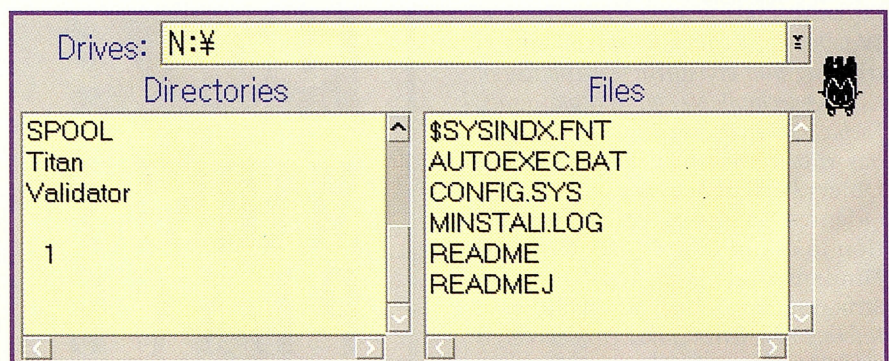


Figure 2: Portion of dialogue containing font presentation parameters on DBCS system.

The first font listed on a DBCS system is System Proportional. However, the font in the dialogue doesn't look similar to the System Proportional. So, maybe it's been adapted for DBCS systems? Nope!

The neat thing here is that the **IMatch** of the System Proportional is 65535. The next font listed is MINCHO, and by the way, it has the **IMatch** of 0. But, this font isn't the one used in the dialogues.

A font called MINCHO Proportional (which incidentally has an **IMatch** of 6), is the font used within the dialogue in Figure 3.

Oh, life is getting very complicated...

So what are we to do? We have no documentation for this situation in the OS/2 Toolkit and no mention of DBCS in regards to presentation parameters. So how do we still allow our applications to be used properly on a DBCS system?

Knowing that we must pay attention to the fonts that are within our dialogues is half the battle. One strategy is to check if DBCS is active; if it is, then selectively change the font of the controls that have had their font set through the presentation parameters.

For example, you might want to set the font for the entire dialogue. This action causes all the controls of the dialogue to inherit the font. These controls are then drawn using that font.

Note that by making this adjustment, the controls will only inherit the owner's presentation parameters upon creation. If you try setting the presentation parameters for the dialogue after it has been created, the controls won't inherit the new presentation parameters. To make sure that you can selectively

change the presentation parameters of controls, set the presentation parameters for each control.

During the processing of the **WM_INITDLG** message, enumerate the controls of the dialogue and set the font on only those controls you want to show DBCS text.

But which font to use?

Ah yes, the main problem we face. Which font do we use in place of the font in the dialogue?

One way to approach this problem, is to determine ahead of time which fonts are used by the various DBCS systems. Then, select the appropriate font to use and hard code it into your application. It's a bit tricky because documentation is not readily available to identify which fonts are available where.

Another way, and this way is preferable, is to use the information within the **FONTMETRICS** structure. Referring back to Figure 3, notice that the MINCHO Proportional has a type of MBCS as well as DBCS. What this effectively means is that the font contains both SBCS and DBCS characters.

So, how does this help us? Well, quite conveniently actually! The best

way to determine which font to use is to query fonts within the system and search for a font that has both single- and double-byte characters.

This trick isn't quite kitten-proof yet. If you have used a font size that doesn't exist in the double-byte font, what do you do? Well, you can leave the current font the way it is or select the next highest-sized font.

Haven't we seen that before?

Now that we know this stuff, how do we apply it? What we did is adapt a sample that we presented previously ("Printing Made Easy?," *OS/2 Developer*, July/August 1995, p. 12). This sample showed how to query printer fonts and match the metrics of the printer fonts to the display.

To adapt the sample, we added the font presentation parameter to the controls of the dialogues. We also added the style to have the DBCS status window at the bottom of the dialogue or window displayed.

Now, if you aren't using the font presentation parameter (**PP_FONT-NAME/SIZE**), the above is basically all that you have to do. Otherwise, if you are using it, a bit more work lies ahead.

Remember, in Figure 2 the DBCS characters didn't appear properly in the list box, even on the DBCS system.

Using some of the information from our previous discussion on DBCS, we query to determine if DBCS is active on the system. If we determine that it is, we then query the fonts on the system.

The fonts that we want to hone in on are raster, proportional (nonfixed width) and MBCS. We do this by finding the fonts that match the resolution that we are running under. This search indicates very quickly that the font is a raster font.



Figure 3: Font Metrics dialogue showing font information on DBCS system.

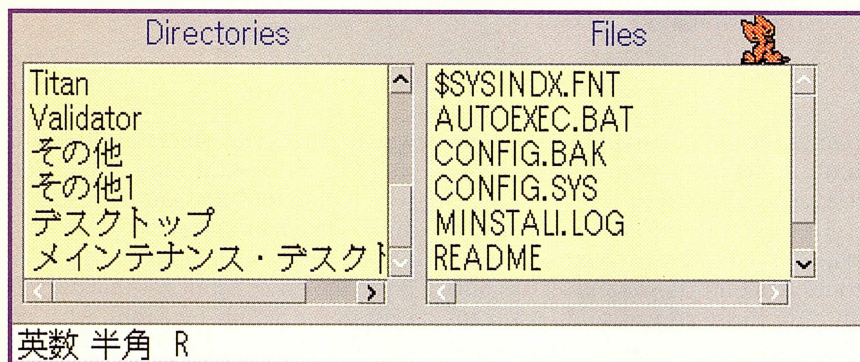


Figure 4: Portion of dialog box without font presentation parameters on DBCS system.

Next, we check to see if the `FM_TYPE_MBCS` flag is set within the `fsType` field of the `FONTMETRICS` structure. If so, we now have a valid font that we might be able to use.

Next, we check to see if the font is a fixed-width font by looking for the `FM_TYPE_FIXED` flag within the `fsType` field. If the flag is found, we ignore the font and check the next font.

If we have satisfied the font type, we then check the size. Because we are using Helvetica 8 pt. in the list box, we most likely want the selected font to be 8 pts. as well. The `sNominalPointSize` is checked by dividing the value by 10 to see if it matches the value desired.

If we get a match, we are done and all we have to do is construct a new presentation parameter value for the `PP_FONTNAME` and set it for the list box control. This check allows us to basically maintain the same graphical appearance across all systems, while only adapting the areas needed.

As you can see in Figure 4, the same dialog box now displays the appropriate DBCS characters.

Other cosmetic concerns

You will notice at the bottom of the dialog boxes in Figures 3 and 4 a white status bar area. These status bar areas are common within dialog boxes running on DBCS systems. For these to be displayed within the dialog box, an additional flag, `FCF_DBE_APPSTAT`, must be added to the `DIALOG` statement of the `DLG-TEMPLATE` within your `.rc` file. This flag can also be added to your standard window as well.

This flag is ignored on non-DBCS systems, so you don't have to worry about any side effects.

You needn't worry about the positioning of the controls within the dia-

logue, because they will automatically be adjusted in position, taking into consideration the status window.

One other concern is the final size your dialog boxes might take on VGA DBCS systems. For example, a dialog box that is 326x316 on a non-DBCS system, is 432x372 on a DBCS system.

The reason for this change is that the MINCHO Proportional font is wider than the standard System Proportional font. This size difference causes the dialog box units to be different, hence the major change in size both vertically and horizontally.

Therefore, dialog boxes that fit properly on a non-DBCS VGA system can be too large for the DBCS VGA systems. You may want to instruct your DBCS-systems users to use a system with a minimum of 800x600 resolution.

The adaptation

In the sample application, we added a new module: `DBCS.C`. This module contains essentially the same DBCS startup code that we introduced in our last column. In addition to the startup code, we have a new function that searches the fonts on the system for the multibyte character set fonts from which we can create the required `PP_FONTNAME` value.

We also added a function, `CenterDlg`, which centers the dialog box within the display. If we are running on a DBCS system, it's within this code that we enumerate the controls of the dialog box and change the font of selected controls to the DBCS font.

On a non-DBCS system, all the `CenterDlg` function does is center the dialog box—none of the enumeration is done.

To aid us in our investigation, we added a new dialog box that allows you to

select a font (display fonts only) to see what its flags are (`fsType`, `fsDefn`, and `fsSelection`), as well as its `IMatch` value.

The basic rules

If you want your applications to run on DBCS systems that use the dialog boxes and windows you have developed, follow these basic rules:

- Inform your users on DBCS systems to use a display of at least 800x600 resolution.
- Don't set the font for the entire dialog box if you are going to provide a DBCS status window at the bottom. You won't be able to change the font of the status window from the non-DBCS to a DBCS font.
- Change only the font of the controls that you know will be displaying DBCS text.
- Enumerate the fonts on the system and search for a nonfixed width raster font that contains MBCS.
- If you aren't using presentation parameters, allow for the fact that your dialog boxes will be wider and higher on DBCS systems.
- Don't use character widths to calculate the width of a string. DBCS fonts contain a large number of characters that make it difficult to cache character widths. Calculate the string width using APIs that can calculate these widths for you.
- If an outline font is requested and not found, the default outline font, Courier, is generally used. Check to see if the `usType` of the `FONTMETRICS` for the font is DBCS—or MBCS, in which case it can be used. Otherwise, don't use the font selected. This only applies when a DBCS font is required.

The stuff that didn't work!

One idea was to set the font for the entire dialog box and then just change the controls that would have the DBCS text. Great idea, and for the most part, it's the easiest way to set the fonts for the controls of the dialog box, because each control inherits the presentation parameters of its owner.

If you're not going to allow the DBCS status line to be displayed, then this method will work just fine. However, this aspect causes the problem with the DBCS status line: it uses the font of the dialog box to calculate the width of

the display area. So, if you use Helvetica 8 pt., then the width of the DBCS text is based on this font. Even if you change the presentation parameters of the dialogue, or for that matter the status area itself, the width is not readjusted.

The problem here is that the status area, while being a window, ignores the **WM_SETPRESPARAMS** message. We thought that if we changed the presentation parameters for the status bar, everything would be purrfect. Well, we were only half right. The text was correctly displayed in the DBCS font, but it was clipped on the right side because the size of the window was based on the original Helvetica 8 pt. font.

It also ignores the **WM_QUERYWINDOWPARAMS** message. We thought we could do a **WinQueryWindowText**, size the text using the proper font, and then resize the width of the status window. In this case, we got back no text.

(Hopefully, the folks that own the DBCS status window are reading this column, so they can update the status window to handle these messages and thereby allow better presentation parameter usage within dialogues running on DBCS systems.)

Déjà vu

Due to the increased interest in custom controls and the release of the new IBM *Universal Resource Editor*, we will revisit custom controls. We will introduce some refinements to creating a custom control and show you how to integrate them with the *Universal Resource Editor*. Stay tuned and remember, keep your stick on the ice. 

Acknowledgements

Special thanks to C.Y. Alexis Cheng of the National Language Technical Centre, IBM Canada; and Reiji Todani of the Yamato Laboratory, IBM Japan for providing insight into the issues of DBCS font selection.

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Resources:

You can download *dbcs.exe* from these electronic sources:

CompuServe's OS2AVEN forum (OS/2 Magazine Section).

File area 11 on the IBM PCC BBS, (919) 517-0001
OS/2 Tools section on the OS/2 BBS for IBM TALKLink customers.

You can also FTP to the site address *prominare.com* and log in as anonymous. The source is located in the */pub/prominare/guicornercodecache* subdirectory.

Also, check out the GUI Corner home page for the article on the Internet at www.prominare.com/prominare/vol3num5.article.html.

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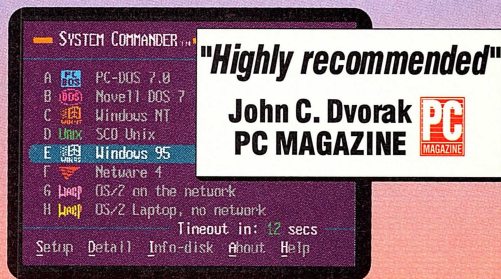
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Using All of Your Resources

LOTUS NOTES 4.0 AND PARTITION MAGIC 2.01. BY BRIAN PROFFIT

Lotus Notes 4.0

IBM's purchase of Lotus Development Corp. generated much speculation about the future of OS/2 versions of popular Lotus products. So, when Notes 4.0 was announced in late January, everyone was anxious to see what Lotus had to say regarding OS/2 versions.

As has been true since the beginning, Lotus made an OS/2 version of Notes Server a priority. OS/2 Warp and Windows NT are the only platforms supported for Notes Server in the initial release of 4.0, with NetWare, HP-UX, Sun Solaris, and IBM AIX versions of Notes Server in development.

On the client side, the news wasn't quite as good. Windows 3.1 and Windows 95 are the only supported platforms in the initial release. The CD-ROM that ships with Notes, however,

includes a beta version of the OS/2 client, which is quite stable and feature-complete, with the ship-level version hot on it. In other words, it wasn't an afterthought that the OS/2 client software was for Notes 3.0. UNIX, Macintosh, Power Macintosh, and Windows NT client versions are also well into beta testing. One of Notes' biggest strengths is its platform independence. Any client can access any server, regardless of the operating system, and share databases created on any platform.

So what's new?

This release is an extremely significant update to Notes, with improvements in nearly every area. It starts with the user interface. As you can see in Figure 1, the interface has a more three-dimensional look. But the changes are

more than just cosmetic. Usability improvements are scattered throughout Notes 4.0 for the end user, the developer, and the administrator.

The most dramatic improvement for end users is the new split-pane window (Figure 2). In the upper-left window, you can quickly navigate between the views available for each database, as changes are instantly shown in the upper-right window. In addition to the standard view list, this pane can also show any special navigators. (I'll mention Graphical navigation tools again when I talk about what's new for developers.) The bottom of the figure shows the optional preview pane. As you move the cursor through the documents, in the view shown in the upper-right pane, a preview of that document's contents appears in the lower window pane. This graphic makes browsing far easier. You can instruct Notes to mark documents as having been read as soon as they appear in the preview window, thus, eliminating the need to actually open documents of little interest. The size of these panes is adjustable by simply dragging the edges. This improved window structure simplifies usability to the point of being worth the price of upgrading by itself.

Properties for most objects can now be set through InfoBoxes—new controls that are similar to OS/2 settings notebooks. New SmartIcons (the rest of the world knows these as buttons on the button bar) have been added, as well as better designs of some of the existing ones. More functions are available through the status bar at the bottom of the window, like quick access to mail functions.

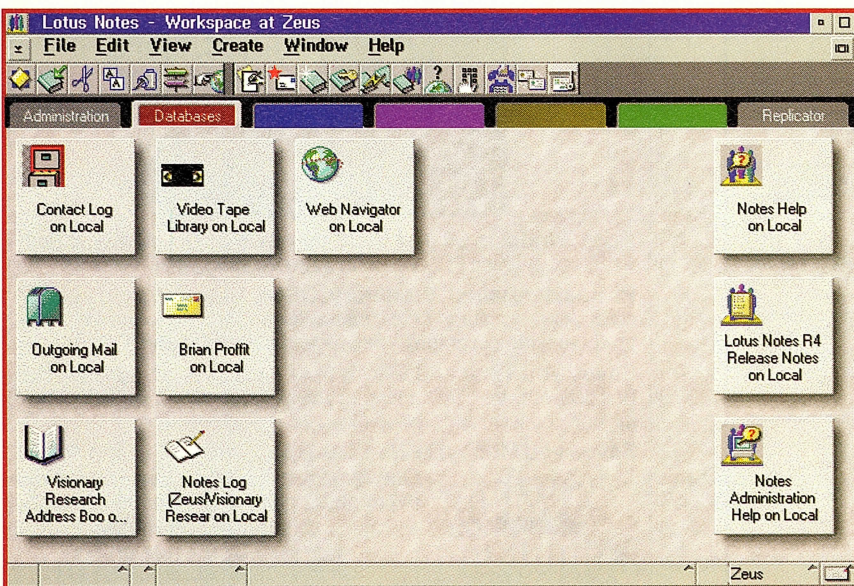
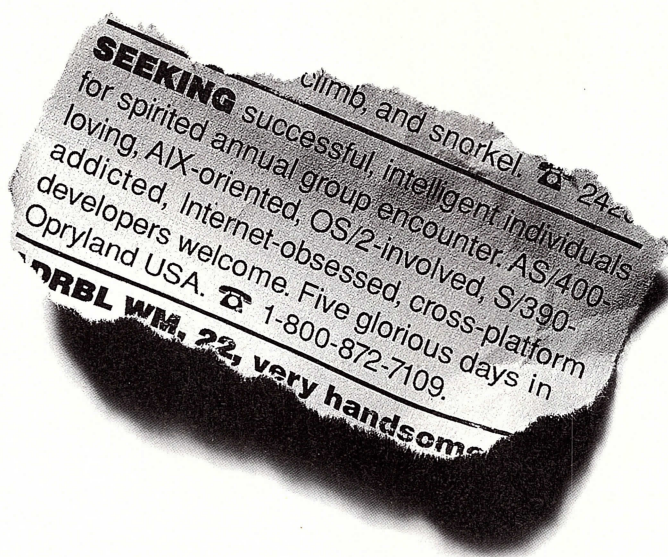


Figure 1: Notes 4.0 has a new three-dimensional look.

Test Drives, cont'd on p. 62



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Test Drives



Figure 2: The new preview window lets you see documents as you browse views.

Test Drives, *cont'd* from p. 60

Within a view, clicking on a column heading will now automatically re-sort the view based on that column (if the developer specified that as a sortable field). The user can now change the width of columns in a view, simply by dragging the edge of the column titles. Information in view columns is no longer necessarily truncated at the end of the column, as you can allow information to flow over to an additional line if needed.

Documents you use frequently can now be dragged into a private folder. Each user can then work from a view that is the small subset of interest to the user, rather than the complete database. Navigation can also be used through the use of links. These embedded icons in a document can immediately move you to a different document, a different view, or even a different database.

Mail has been improved with the ability to select different types of letterhead and stationery, include automatic links to documents so the recipient can see the referenced page easily, assign icons to mail to indicate the type of message it contains, and set up an automatic reply to incoming mail. (For example, "I'm out of the office, but your message has been received. I'll respond when I get back in on Thursday.")

Mobile users can create several location entries. When you're in the office, select that location and Notes

will accept your entries for that location, such as network connection. When you're at home, selecting that location might indicate a dial-up connection either directly to the Notes server or through a remote LAN service. For example, a hotel location might require the prefix nine for an outside line. It also has a Lite version of the help database to save disk space on laptops. Mobile users will appreciate the new Replicator, which greatly simplifies the task of replicating databases

between systems. The program allows you to summarize lengthy documents to cut down connection time.

Your documents can be fancier now, with goodies such as lists with bullets, numbered lists, and up to 240 text colors. Paragraphs can be grouped into sections, which can be expanded or collapsed like an outline. Links to views

and other databases can be included, as well as hot spots. These special locations display pop-up text when the user moves the pointer over them. (Each of the SmartIcons is now a hot spot, with pop-up help text displayed when the pointer moves to them.) Similar to most word processors, you can define named styles and use them in your documents to make automatic font changes.

You can now do text searches through documents, even in databases that haven't been indexed. Searches can also be saved for later use. You can also restrict access to specific documents, rather than securing only at the database level.

Because the Internet has become one of the hottest ways to access information, Lotus included Internet access in Notes 4.0. The InterNotes Web Navigator allows you to surf the Net from within Notes (Figure 3). Web pages are downloaded into Notes databases, allowing you to review them at your leisure—offline. Pages that don't change frequently might only need to be reloaded every week or so, saving a lot of surfing time.

Test Drives, *cont'd* on p. 67

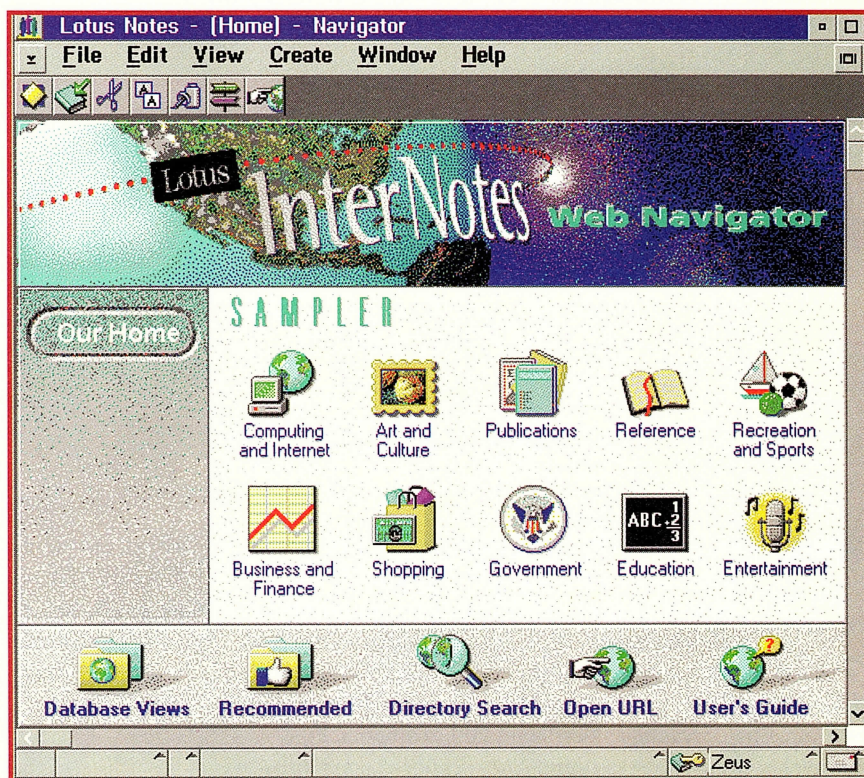


Figure 3: The InterNotes Web Navigator allows you to browse the Web and bring pages directly into Notes databases.

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04 ☐	54 ☐	Pentium based desktop
05 ☐	55 ☐	Power PC based desktop
06 ☐	56 ☐	Intel based laptop/notebook
07 ☐	57 ☐	Power PC based laptop/notebook
08 ☐	58 ☐	Macintosh
09 ☐	59 ☐	Sun SPARC
10 ☐	60 ☐	IBM RS/6000
11 ☐	61 ☐	AS400
48 ☐	98 ☐	None of the above
49 ☐	99 ☐	Other (please specify): _____

5. What is your personal primary hardware platform at work? (check ONE only)

- 01 ☐ Mainframe
- 02 ☐ Workstation
- 03 ☐ Laptop
- 04 ☐ Minicomputer
- 05 ☐ Microcomputer
- 09 ☐ Other (please specify): _____

6. How are you involved in purchasing hardware, software, and development tools for your company? (check ALL that apply):

Computer Hardware	Computer Software	Software Development Tools
11 ☐	21 ☐	31 ☐ Make the purchase
12 ☐	22 ☐	32 ☐ Approve the purchase
13 ☐	23 ☐	33 ☐ Select the brands and suppliers
14 ☐	24 ☐	34 ☐ Recommend brands and suppliers
15 ☐	25 ☐	35 ☐ Evaluate products for purchase
16 ☐	26 ☐	36 ☐ Determine need
17 ☐	27 ☐	37 ☐ Formal or informal consulting to other departments
19 ☐	28 ☐	39 ☐ None of the above
20 ☐	30 ☐	40 ☐ Other (please specify): _____

7. What is the scope of your purchasing involvement in your company? (check ALL that apply):

Computer Hardware	Computer Software	Software Development Tools
51 ☐	61 ☐	71 ☐ All locations for the entire company
52 ☐	62 ☐	72 ☐ Multiple locations of my company
53 ☐	63 ☐	73 ☐ Entire worksite location
54 ☐	64 ☐	74 ☐ Multiple departments at my location
55 ☐	65 ☐	75 ☐ My department
56 ☐	66 ☐	76 ☐ My workgroup
57 ☐	67 ☐	77 ☐ Myself
58 ☐	68 ☐	78 ☐ Multiple companies as a VAR or consultant
59 ☐	69 ☐	79 ☐ None of the above
60 ☐	70 ☐	80 ☐ Other (please specify): _____

B6E14

Continue on back

8. Do you design/write/customize software?

91 ☐ Yes. 92 ☐ No.

9. Which programming language(s) do you know, use, or plan to purchase? (Check ALL that apply):

Know	Use	Plan to Purchase	Language
01 ☐	31 ☐	61 ☐	Assembler
02 ☐	32 ☐	62 ☐	C
03 ☐	33 ☐	63 ☐	C++
04 ☐	34 ☐	64 ☐	COBOL
05 ☐	35 ☐	65 ☐	DB2
06 ☐	36 ☐	66 ☐	dBase
07 ☐	37 ☐	67 ☐	FORTRAN
08 ☐	38 ☐	68 ☐	Modula-2
09 ☐	39 ☐	69 ☐	Pascal
10 ☐	40 ☐	70 ☐	REXX
11 ☐	41 ☐	71 ☐	Smalltalk
12 ☐	42 ☐	72 ☐	SQL (PL-SQL, etc.)
13 ☐	43 ☐	73 ☐	Visual Basic
28 ☐	58 ☐	88 ☐	None of the above
29 ☐	59 ☐	89 ☐	Other (please specify)

10. My responsibility is to develop and/or manage the development of (Check ALL that apply):

- 91 ☐ Software for my personal use
 92 ☐ Software for my company's own use
 93 ☐ Software for my company to sell
 94 ☐ Software as a consultant or contractor to other companies
 99 ☐ Other (please specify)

11. Which operating system do you use, use as a development environment, and/or target for the software you develop? (check ALL that apply):

Use	Use for Development	Target for Development	Operating System
01 ☐	21 ☐	41 ☐	OS/2 v.1.x
02 ☐	22 ☐	42 ☐	OS/2 v.2.x
03 ☐	23 ☐	43 ☐	OS/2 Warp
04 ☐	24 ☐	44 ☐	OS/2 Warp LAN Server
05 ☐	25 ☐	45 ☐	OS/400
06 ☐	26 ☐	46 ☐	AIX or other Unix version
08 ☐	28 ☐	48 ☐	MS-DOS/PC-DOS
09 ☐	29 ☐	49 ☐	Windows 3.x
10 ☐	30 ☐	50 ☐	Windows 95
11 ☐	31 ☐	51 ☐	Windows NT
12 ☐	32 ☐	52 ☐	Macintosh OS
16 ☐	36 ☐	56 ☐	CICS
13 ☐	33 ☐	53 ☐	VAS/VAX
14 ☐	34 ☐	54 ☐	VM
15 ☐	35 ☐	55 ☐	MVS
19 ☐	39 ☐	59 ☐	Other (please specify)

12. My Company is part of the IBM OS/2 Developer Assistance Program:

71 ☐ Yes. 72 ☐ No.

If yes, my company's DAP number is:

13. Do you work for a Fortune 500 company?

81 ☐ Yes. 82 ☐ No.

14. How many employees does your company have in all sites? (check ONE only):

01 ☐ 1-9 07 ☐ 2500-4999
 02 ☐ 10-24 08 ☐ 5000-9999
 03 ☐ 25-99 09 ☐ 10000-14999
 04 ☐ 100-499 10 ☐ 15000-24999
 05 ☐ 500-999 11 ☐ 25000 or more
 06 ☐ 1000-2499

15. Are you using, supporting or developing for any of the following:

	Using	Supporting	Developing for
Lotus Notes	23 ☐	24 ☐	25 ☐
DB2	33 ☐	34 ☐	35 ☐

16. Describe your involvement with the internet (Check ALL that apply):

- 40 ☐ Develop software
 41 ☐ Develop content
 42 ☐ Administer a web site
 43 ☐ User
 45 ☐ None

17. What speed is your connection to the internet (check ONE only):

50 ☐ 9600 bps 55 ☐ No internet connection
 51 ☐ 14.4K bps
 52 ☐ 28.8K bps
 53 ☐ 56K bps or higher

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Test Drives, cont'd from p. 62

More for developers too

The first thing you should know is that your existing 3.x applications will continue to run just fine on Notes 4.0 servers. This fact gives you the freedom to roll out 4.0 and then upgrade your applications to exploit new features at your leisure.

There are some great new features, too. Macros are gone. Don't panic, though, they have been replaced by more intelligent agents. An agent isn't restricted to the @ function interface used before (although some new functions have been added for Release 4). You can now use simple commands such as **Send mail message** in your agents.

Alternatively, you can write your agents using LotusScript, the scripting language that Lotus is now using for all of its software. This cross-platform language doesn't stick to the least common denominator in its function, although developers must do so in their applications. For example, LotusScript offers OLE functions that won't work under OS/2 and allows use of HPFS file names that won't work on Windows 3.1. Developers must keep in mind all possible platforms on which their programs can be run. Built on BASIC, LotusScript adds object-oriented extensions and includes the ability to call external DLLs written in other languages.

Agents can be activated automatically, for example, when mail is received, when a form is opened or closed, or when a document is created or changed. A simulator allows you to test agents during development without actually changing your live documents.

NotesFlow is a collection of development tools that allow you to create complete workflow applications, including passing information back and forth with other applications. Be aware that it's largely OLE-driven. You can share information with database products other than Notes by using ODBC.

Navigators are new graphical options that developers can

give their users to make life easier than browsing through lists of views and documents. Finding the needed information can be as simple for the user as clicking on an icon the developer created. Developers can also create Action Bars to make it easy for users to perform specific tasks. The InfoBox, mentioned earlier as the interface for modifying object properties, is a new control that is also available to developers that provides a convenient graphical control for many information presentation needs.

Don't forget administrators

New database analysis functions are available, which let you gather and organize information, such as reads and writes to a database, document creations and changes, design changes, and so on. Your databases can be larger, too, with a maximum size of four gigabytes. Indexing of those databases is a big job that can now take place in the background.

A new Administration Process provides a single reference point for the maintenance of user names, groups, and access control lists that can be replicated across all servers in a domain. And for greater performance, Lotus is offer-

ing scalable versions for SMP versions of OS/2, Windows NT, and UNIX.

You can define pass-through servers so users can access other servers, even through different protocols.

Glee or flee

I really hate writing product reviews that sound like press releases, but the more I use Notes 4.0, the more I like it. I could only come up with two negative things to say about Notes. First, a weird bug prevents Notes from installing or running if OS/2's comet cursor mouse pointer is active. Second, Notes refuses to let Xit add its buttons to Notes' title bar.

If you're using Notes 3.x, I recommend upgrading. An excellent Migration Guide is included to take you through the process. If you're not using Notes, and you have a need to gather, review, and share information, now is the time to consider Notes.

Partition Magic 2.01

As the television networks move toward summer reruns, I thought I'd try to help *OS/2 Magazine* become as popular as *The X-Files* by following TV's lead and taking another look at a product that I've previously reviewed. Besides, while point

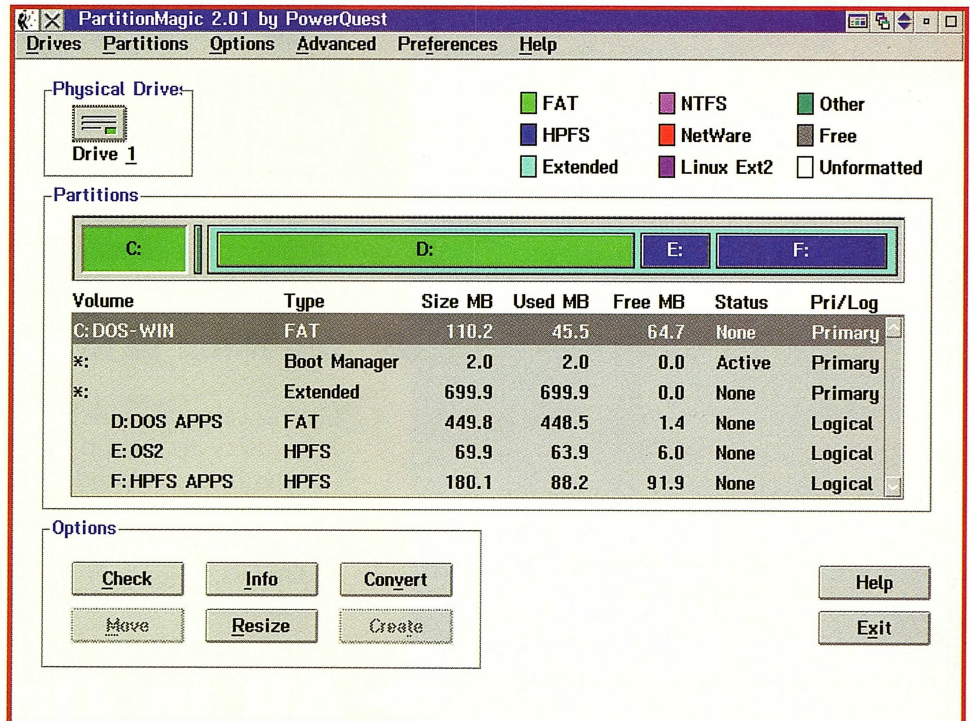


Figure 4: Partition Magic.

Test Drives

Test Drives, cont'd from p. 60

releases are relatively common, it's usually significant when a vendor changes the first digit of a version number!

An aptly named product

For those who have cleaned their birdcages and no longer have the review of version 1.0 (July 1995, p. 17), let me remind you what Partition Magic offers. It allows you to do something never before possible: move and resize partitions on your disk drive without forcing you to delete partitions, recreate them, reformat them, and then reload their contents from backup. It can also convert partitions from FAT to OS/2's High Performance File System (HPFS), without harming the data (in theory, always backup your disk before making any changes to partitions). This function is just the thing for those who have decided they're finished with DOS/Windows once and for all, allowing them to reap the benefits of HPFS without a painful conversion. However, it's a one-way process. HPFS partitions can't be converted back to FAT.

Now beefed up

For version 2.0, Power Quest has added a few new functions. Those experimenting with multiple operating systems will be glad to hear that NTFS partitions can now be moved, and Netware and Linux Ext2 partitions are also recognized. More functions can be performed within Partition Magic itself, making FDISKPM less necessary. For example, you can create and delete partitions directly, as well as set the active (boot) partition. You can also format a partition from within Partition Magic. An interesting new option is the ability to hide a partition. If you want to prevent someone from accessing your data while you're away, simply have the partition disappear from the drive table. Be aware, though, that this action will cause the drive letter for all subsequent partitions to change.

More information about your disk partitions is displayed. For example, Partition Magic shows how much space is wasted in a partition due to cluster size. I have one FAT partition of 450MB, which I deliberately kept under 512MB to keep cluster sizes at 8K rather than the

more wasteful 16K of larger FAT partitions. I was surprised when Partition Magic reported that I had a whopping 50MB of wasted space dangling in these large clusters. Clearly, breaking it up into two partitions under 256MB (and thus, with a cluster size of 4K rather than 8K) would free up a lot of space.

In fact, Partition Magic can make that process much easier. An entry in the menu implies that you can change the cluster size of a partition. Actually, though, those sizes are a fixed part of the FAT file system and not subject to manipulation by Partition Magic. If you indicate that you want to decrease cluster size, Partition Magic responds by shrinking the partition itself (if there is enough unused space in the partition) to the size needed for FAT to assign it the desired cluster size.

If there isn't enough unused space—certainly the case with my large FAT partition—another technique exists. Because approximately 40MB is available in the partition, I used Partition Magic to shrink it so the partition was full. Then I created another partition

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Test Drives

that used the new available 40MB. I then copied 40MB from the old partition to the new one and deleted them from the old partition. This change allowed me to shrink the partition again and then resize the new partition to gobble up the extra space. Going through this iterative process a few more times gave me two partitions smaller than 256MB with 4K cluster sizes and around 25MB of additional disk space available, due to less waste in those clusters. Sure, the iterative process was a bit tedious, but it was easier than backing up, repartitioning, reformatting, and reloading everything.

Glee or flee

Corporate users in particular will be pleased with the technical support. Power Quest makes periodic updates available via its BBS, FTP, and Web sites. The version reviewed was the shrink-wrapped version 2.0 plus the patch to 2.01, which I downloaded from Power Quest's web site.

The biggest complaint that I've had with version 1.0 was the prohibitive

pricing for power users. Power Quest addressed that by changing to separate personal and professional licenses, as well as cutting the cost to personal users in half. As I said in my first review, those who keep all their files in a single large c: partition won't find much use for Partition Magic. But with 850MB disk drives becoming the minimum, it has gone from somewhat wasteful to downright foolish to use your disk that way. Partition Magic makes it painless for you to get more for your money by repartitioning large disks and recovering wasted space.

If you decided not to buy version 1.0, the new features of 2.0 and its lower price make it well worth considering. On the other hand, if you have a copy of 1.0, I'm not sure it's worth the money to upgrade unless you're also using Windows NT or Linux. It feels more like a version 1.1 than a 2.0. 

Brian Proffit was part of IBM's OS/2 team and left IBM to become the director of PC Week's Corporate Labs. He is now the president of Visionary Research, senior con-

tributing editor for OS/2 Magazine, and solutions advisor to PC Magazine. E-mail him at 75300.1466@compuserve.com.

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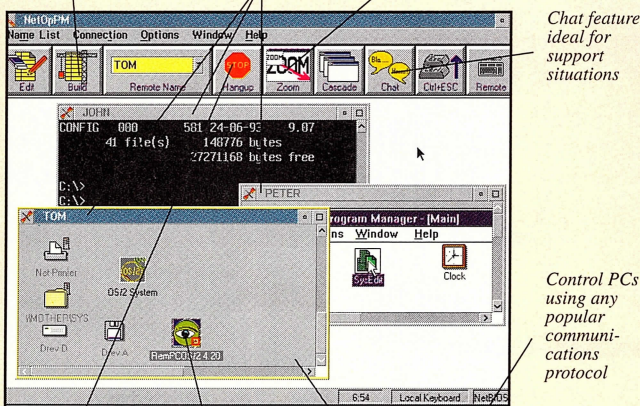
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Mathematica is a program-mable symbolic and numeric computational software system that is capable of producing sophisticated multidimensional graphs. It has been available on UNIX (numerous flavors), DOS, Macintosh, Windows (numerous flavors), and other systems for many years. However within the past year, Wolfram Research Inc. has released an OS/2 version, 2.2.3, and an update, 2.2.4.

If you're not familiar with this product, Mathematica is a remarkable program that is useful in mathematics, physics, chemistry, engineering, or any other discipline that requires manipulations of formulae and numbers. It can solve algebraic equations, multivariable differential equations, and simultaneous equations. It can manipulate matrices and lists, as well as generate incredible graphics in multiple styles and dimensions, including fractals, knots, and maps. There are over 100 books on how to use Mathematica, including textbooks that teach calculus through the use of Mathematica. Conceived in the late 1970s by Stephen Wolfram, a Caltech physicist, Mathematica has been commercially available since 1987.

For this review, I used and tested Mathematica for OS/2, both 2.2.3 and 2.2.4, and compared it with the Windows version I had been using (2.2.3), which can run under OS/2. I have used Mathematica for both my educational and research duties and, hence, was interested in the product as a single user who develops lessons and solves numerous multivariable problems.

Installation

The first release came with three disks, a setup book, the license and release notes, the standard manuals for Mathlink and Mathematica, and the Mathematica bible: Wolfram's *Mathematica: A System*

for *Doing Mathematica by Computer*, second edition. I installed the product on a Pentium-100 with 32MB of RAM, running Warp with IBM's TCP/IP 2.0 (later updated to Warp Connect with TCP/IP and peer-to-peer). To test its limits, I also installed it on a 486-66 with 16MB of RAM, also running Warp with TCP/IP. Testing and use occurred over several months.

Wolfram claims that only 8MB of RAM are required with plenty of disk space—10 to 14MB for installation and up to 16 to 25MB for the swapfile. I wouldn't recommend anything less than 16MB of RAM, and don't be alarmed to see your swapfile explode to 30MB or more. Installation was quick, except it finished less than gracefully with a DOSCALL error, which didn't inspire much confidence. It turned out that the error didn't affect the program, and I was able to start the program without any problems. Unfortunately, the next step left me a bit disappointed.

Mathematica possesses two types of interfaces. The first interface is text-based, and Wolfram's book is written using this style. Text is displayed using a nonproportional font, such as courier to align superscripts and subscripts, and plots are displayed in separate windows on the desktop. The other interface is referred to as the notebook

interface, which is graphically based. Text can be displayed using proportional fonts (except for the output) that are more readable, and scalable graphics are incorporated directly into the worksheet. The notebook interface is more sophisticated, possesses more features and, in my opinion, far more usable. Macintosh, NEXTSTEP, Windows, and other flavors of Mathematica use the notebook interface. Guess what OS/2 gets: that's right, the text-based version (Figure 1).

Fortunately, just about the time I received 2.2.3, version 2.2.4 came out, which included a graphics interface. To those who purchased 2.2.3, the upgrade is free. After a quick phone call, 2.2.4 arrived (six disks) and it installed without a problem, setting up a folder containing icons for Mathematica for OS/2, the graphics view applications, an .inf file containing information from the new setup book, and a Windows icon. That's right—the notebook interface for OS/2 is really the Windows version of the notebook interface. The updated Mathematica for OS/2 works by connecting the Windows front end (the interface) with the OS/2 kernel (where the calculations are performed) through Mathlink.

Mathlink is a remarkable system that allows properly written programs of any type to interface with the Mathematica kernel. For this connection, Mathlink requires either TCP/IP for OS/2 or the Internet Connection. I used it under TCP/IP (2.0 and 3.0), and it worked perfectly. One could envision how users working in a client/server environment would consider this arrangement advantageous. For example, you could operate the Windows interface on a slower, less-equipped computer and have the actual calculations performed on a more stable and powerful OS/2 computer. This arrangement is common between Macs and UNIX workstations. For myself, it meant

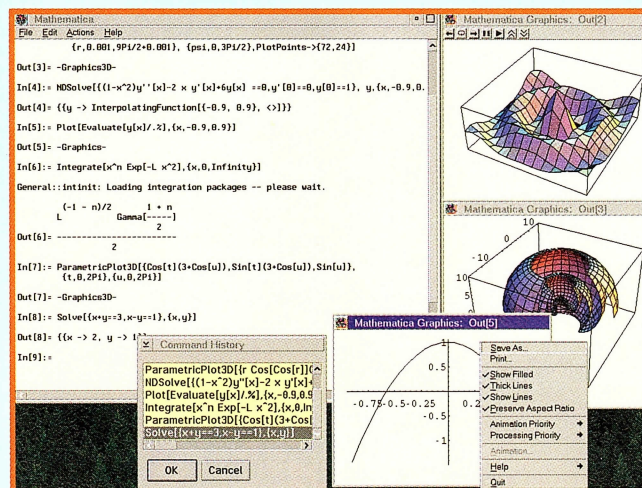


Figure 1: A multithreaded, but simplistic and cumbersome interface detracts from a powerful application.

adding Windows code to the overhead and, thus, a loss of robustness.

Two ways to talk

If you're familiar with the Windows version of Mathematica, then you'll notice no differences between it and the Windows front end for OS/2. You enter a command on one or multiple lines, press <Ctrl+Enter> to activate the processor, and the output is displayed on the next line with the command number (Figure 2). Graphics, including animation, appear within the notebook, equations on previous lines can be edited and re-executed, and cells (individual input/output sections of the worksheet) can be selected, moved, merged, divided, and deleted. There is a button bar at the top for opening and closing files, changing fonts, running animation, and for cutting, pasting, and changing the perspective of three-dimensional graphs. The interface is feature-rich, and most operations are a click away.

Conversely, the features in the text-based OS/2 interface—still available under 2.2.4—are minimal. You can save the text buffer to a file, cut and paste text, change the font (for readability, a nonproportional font is necessary), and that's about it. You can't simply click on a previous equation, edit it, and have the program re-execute the command, because new commands must be entered on a new line. You can recall previous commands using the command history option, which presents a list of previous commands, but I found this to be more cumbersome and less readable in the final worksheet. Worst of all, while individual variables and commands can be saved, entire text-based worksheets can't be saved and then recalled for re-editing as easily as they can with the notebook interface. Of course, the Windows front end is

not HPFS aware, while the text-based front end is aware.

Finally, graphics are displayed using a PM graphics viewer application, which is provided with the Mathematica software in a separate window on the desktop. Graphics can be saved as either special Mathematica PostScript files or as regular PostScript files and can be displayed later. One pleasant aspect about the graphics viewer is that it makes good use of the right mouse button. However, the viewpoint features found in the notebook interface are not available, because the graphic would have to be rerendered.

As for system demand, with no other Windows programs running, the Windows front end requires about 3MB to load plus another 3MB for the kernel, while the OS/2 text-based interface with kernel requires approximately 3.5MB of free memory to load. However, each graph in the text-based interface can demand possibly 2MB of memory. The Windows version (front end plus kernel) requires approximately 6MB of free memory to load, and graphics within notebook interfaces are far less demanding. At this point you might ask, if the OS/2 version is more cumbersome to use or requires more system resources, then why would anyone choose it over the Windows version?

Please don't crash...again

Everyday execution of Mathematica for Windows under Windows, for my students and myself, is viewed as a computer form of Russian Roulette. The excitement of obtaining a result within seconds or a beautiful parametric three-dimensional plot is far too frequently interrupted with a general protection fault (GPF), a hung cursor, or a sudden reboot. Mathematica is demanding on both the user and the system. In testing the stability of the software, I found I could stress the Windows version executing under Windows to the point where the system would reboot every 10 minutes. While executing under OS/2, the Windows version would continue to generate GPFs or hang; however, only once did it force a system reboot. In addition, I found I could generate a number of operations, such as inverting a 500x500 matrix, which was impossible using the Windows version executing under either Windows or OS/2.

Using these same tests, the OS/2 versions failed far less frequently and would perform nearly every stressful calculation I requested. Not surprisingly, of the two types of interface, the all-OS/2 code text-based interface was the most stable. But that wasn't all.

In terms of interfacing with Mathematica, the Windows version and the Windows front end to the OS/2 version execute as pseudo-multithreaded applications. You can't ask either front end to run animation while calculating large tables simultaneously, however, you can edit commands and move graphs as calculations are being performed. The OS/2 version, with its text-based PM interface, is multithreaded and slick when used with the graphics viewer. I found this particularly useful when demonstrating standing waves to some students, as I could generate graphs and animation and have the animation

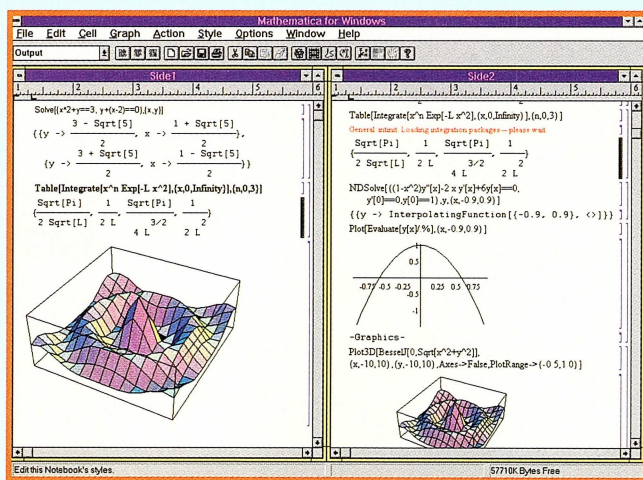


Figure 2: Including a Windows interface helps, but it adds another layer of software.

Table 1: Performance measurements.

Shown here, is the time in seconds, for the Windows and OS/2 versions under various configurations to execute commands. A lower number is better. (Win/Win—Windows version under Windows 3.11, Win/OS2—Windows version using Windows code under OS/2, WinFE/OS2—Windows front end using OS/2 kernel, OS/2—OS/2 front end and kernel.) Split times list the time it takes to generate code for a graph and the time to display a graph.)

Task:	Win/Win	Win/OS2	WinFE/OS2	OS2
Find solutions to 10 algebraic equations	0.60	0.65	0.38	0.34
Integrate 10 different functions	1.98	2.03	9.90	10.02
Find solutions to 10 differential equations	1.25	1.19	1.37	1.28
Calculate Pi to 5000 digits	2.69	2.75	2.09	2.09
Calculate 10001!	6.87	6.97	5.25	5.18
Invert a 200x200 matrix	8.29	8.19	3.18	3.09
Invert a 500x500 matrix	failed	failed	44.28	38.0
Generate 10 2D line plots	1.92	2.19	3.03	2.6/12*
Generate 5 3-D surface plots	3.68	4.07	4.28	1.7/8*
Generate 10-frame 3-D plot movie	27.6	30.8	45.7	42/50*

execute in the background while it performed other calculations. I could also execute multiple copies of Mathematica for OS/2 simultaneously. Under Windows, I crashed the system when trying to start multiple copies of Mathematica.

Go, go, go...

Mathematica for OS/2 performs most calculations as fast or much faster than the Windows version, but I was able to create a few exceptions. When graphics are required, Windows is always faster. Table 1 shows some typical commands and their timings using different configurations. (Actual commands can be obtained from the author.) If you want to rank the configuration by speed, top marks go to the OS/2 text-based version (except for graphics and certain integrations), closely followed by the Windows front end using the OS/2 kernel, followed by the Windows version under Windows, followed by the Windows version under OS/2.

For tasks requiring graphics, the OS/2 versions (text based and notebook) are occasionally the fastest to generate code, but always the slowest

to display it. If numerous plots are required, the OS/2 versions can sometimes be agonizingly slow as the system swaps out large quantities of memory. However, unlike the Windows version, in my experiments the OS/2 version nearly always recovered. When pushed, the Windows version crashed or hung. Animation speed was comparable except if there wasn't enough free memory and if too many frames were needed. In that case, the text-based OS/2 version would occasionally quit, erase all the images, and return with a memory error.

Tallying up

After spending an extensive amount of time with both versions of Mathematica, I realized the OS/2 implementation of Mathematica mirrors the perception of OS/2 as a desktop system. Comparing the Windows version to the OS/2 versions, the OS/2 version was faster, multithreaded, and exceedingly more stable but possessed an interface only a mother could love. To improve the interface, Windows software was used. Amazingly, the interface was not simply a quick-n-dirty port from Windows code, for exam-

ple, Word for OS/2, but the actual Windows code itself. This half-hearted interest is characteristic of other companies. While the ISVs recognize the superiority of OS/2's basic structure to Windows (3.x and 95) structure, many are concerned about a weak OS/2 market. The result is OS/2 applications, which barely take advantage of the features of OS/2 and the Workplace Shell. Wolfram's OS/2 efforts are ironic now that OS/2 appears to outsell new Macintoshes, because the first commercial version of Mathematica appeared on the Macintosh.

Given the simplistic interface and the Windows band-aid, you might suspect I would be unwilling to recommend the OS/2 version. But because robustness and performance are exceedingly important for this type of application, my opinion is that the OS/2 version, warts-and-all, is a better and more useful product than the Windows version (3.x/95). **OS/2**

Resources:

Mathematica for OS/2, 2.2.4 (\$995, \$795 academic)

Wolfram Research Inc.

(800) 441-6284 (U.S. & Canada)

(217) 398-0747

Email info@wri.com

WWW <http://www.wolfram.com>

READER SERVICE NO. 120

Need More? Call an API?

BY DICK GORAN

Frequently, the need arises to do some task from a REXX program that the language itself doesn't support, such as accessing a database or performing a TCP/IP or LAN function. That's when you are told to find the Application Programming Interface (API) for the desired task. Quite simply, APIs are code modules that support interfacing to other code modules or devices. One module that almost all OS/2 REXX programs use, which could be considered an API, is *rexutil.dll*. It provides OS/2 system service functions. Almost any DLL that is REXX-aware, meaning that it can be called from a REXX program, is an API. The purpose of this month's column is to make the reader aware of a number of APIs that exist; whether they are free-ware, shareware, or commercially available products. Including an API in this column doesn't constitute an endorsement of the package. In many cases, the author hasn't actually used very many of the APIs that are listed. My main purpose is to make the OS/2 REXX user aware of some of the facilities that are available and where to obtain them.

One of the first places to look for REXX APIs is Hobbes. Hobbes is actually an FTP site located on a computer at New Mexico State University, which serves as one of the largest repositories of OS/2 software in the world. This FTP server supports anonymous login, so anyone can download files from it. Table 1 contains a list of some of the REXX packages available on Hobbes, at the time of this writing. Because Hobbes changes on a daily basis, I recommend that you get a new list periodically. Update your list by connecting to the Internet via a provider of

**Almost
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your choice and starting an FTP session, either via FTP-PM, from an OS/2 command line, or with any of the third-party FTP programs available for OS/2. (You'll also find a slew of FTP alternatives on Hobbes.) Once you're logged in to Hobbes, change to the *os2/dev32/rexx* directory for the latest REXX APIs. Another Internet site for free OS/2 REXX APIs is located at <http://www.quercus-sys.com/rexxfree.htm>.

Two of the more popular commercial REXX APIs are **REXX SuperSet/2** from SoftTouch Systems and **REXXLIB** from Quercus Systems. These packages contain general purpose, system-related functions that also allow access to information and functions that are operating-system related. Quercus markets **REXXTERM**, a full-featured asynchronous communication program for OS/2

that provides extensive support for user customization and script writing with REXX. Other major features include multiple dialing directories, built-in text editor, host mode, flexible keyboard configuration, VT102 and VT52 terminal emulation, as well as Xmodem, Ymodem, Zmodem, Kermit, and CompuServe-B file transfer protocols.

IBM provides **InterfloX**, a programmer's toolkit that provides a REXX API to Lotus Notes. It enables an OS/2 REXX program to access, modify, create, and delete Lotus Notes databases and documents. This toolkit allows the creation of complex applications and the automation of routine tasks. It also makes possible the connection of Lotus Notes to host systems and other databases such as DB2/2. Further details on InterfloX can be found at <http://www2.hursley.ibm.com/rexx/rexxflox.htm>.

OS/2 Warp, in its various flavors, includes APIs that you can use—if you can decipher the accompanying documentation. For example, **MMPM/2** comes with *mciapi.dll*, an API that allows the use of various multimedia devices, including digital audio, digital video, and MIDI players from within a REXX program. Sparse documentation for using the MCI API is included in your **Multimedia** folder. Full documentation for the MCI API interface is included with the toolkit found on IBM's Dev-Con CD-ROMs. For those that don't have access to an OS/2 Toolkit, you can download a list of the MCI API error messages via anonymous FTP from ftp.cfsrexx.com/pub/mmpm_err.zip or with a Web browser that supports FTP from <http://www.cfsrexx.com> in the REXX-related files page. I have also created a sample program that will play all



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**Find It
on the
Web!**

The REXX Column

Table 1: Hobbes files.

<i>base64.zip</i>	Encode/decode files in Base64.
<i>cmdline1.zip</i>	A powerful data input routine for REXX.
<i>colordlg.zip</i>	A simple color selection dialog for VX-REXX.
<i>datertgl.zip</i>	REXX procedures for working with sorted dates.
<i>etools.zip</i>	A collection of REXX .cmd files and misc. tools.
<i>filerx.zip</i>	FileREXX, file, and device I/O routines for REXX.
<i>filerx11.zip</i>	FileREXX 1.1 deals with binary files in REXX.
<i>ft.zip</i>	Routine that changes file type EAs.
<i>gbj100.zip</i>	Wptools, WPS object settings library for REXX.
<i>grfxrexx.zip</i>	REXX utils to fetch information from graphics files.
<i>grxsum.zip</i>	SoftTouch Systems REXX SuperSet/2 information.
<i>icrexx.zip</i>	IBM Continuous Speech REXX Interface.
<i>mkbko021.zip</i>	Make Book Object is a script that creates icons for .infs.
<i>mnrexx10.zip</i>	Get access to WPS objects from REXX.
<i>pds.zip</i>	Panel Display System and user interface system for REXX.
<i>rexxmenu2.zip</i>	Parse text file for menu selection.
<i>rexxvim.zip</i>	Vendor Independent Message (VIM) access for REXX.
<i>rexxbtrv.zip</i>	Rexx Interface for OS/2 Btrieve.
<i>rexxlib.zip</i>	Quercus System's REXXLIB REXX function package.
<i>rexxmath.zip</i>	Math functions for REXX with source.
<i>rexxobjv.zip</i>	REXX samples for use with OS/2 Object Vision.
<i>rexxtool.zip</i>	REXX Tools—toolkit for REXX development.
<i>rox.zip</i>	REXX function package for object-oriented programming.
<i>rxasyn20.zip</i>	RXASYN 1.5 is an asynchronous communications API for REXX.
<i>rxbas206.zip</i>	REXXBase 2.06, REXX functions for dBase III/IV files.
<i>rxcls.zip</i>	Compile REXX programs into stand-alone executables.
<i>rxdate20.zip</i>	REXXDate 2.0, date function package for REXX.
<i>rxdlg10.zip</i>	REXX Dialog, add full PM interface to REXX programs.
<i>rxdlg11.zip</i>	REXX Dialog uses PM dialogs in REXX.
<i>rxfnset.zip</i>	RXFNSET, REXX-callable DLL with system functions.
<i>rxgwa1.zip</i>	EBCDIC to ASCII REXX functions.
<i>rxipc.zip</i>	Basic Interprocess Communication for REXX.
<i>rxlogin.zip</i>	REXX procedure that asks for a password.
<i>rxmulch1.zip</i>	Replaces/counts strings in files (REXX).
<i>rxset211.zip</i>	RxFnSet 2.11, REXX callable DLL with task and process API.
<i>rxu19.zip</i>	RXU 1.9, rich set of REXX functions for OS/2 API.
<i>rxusmp17.zip</i>	PI2 displays process status information.
<i>rxvimd.zip</i>	REXXVIM, VIM toolkit for REXX.
<i>rx19.zip</i>	Extra REXX functions for REXX, VX-REXX, and VP-REXX.
<i>seldel.zip</i>	Selectively delete applets that come with OS/2.
<i>textfilt.zip</i>	Collection of text filter scripts (REXX).
<i>watool10.zip</i>	REXX Interface with Comm. Manager/2 3270/5250 sessions.

of the .wav files specified in the **System Setup/Sound** configuration notebook on each OS/2 system where MMPM/2 is installed. While the full listing is too large to include in this column, I have included some code fragments for the purpose of explaining the code being used. (The sequential line numbers are for explanatory use only and are includ-

ed in brackets.) The full program, *9605ls01.cmd*, can be downloaded from the OS2AVEN forum, Library 2 on CompuServe; via anonymous FTP from *ftp.cfsrexx.com/pub*; or with your Web browser from *http://www.cfsrexx.com* in the REXX-related files page.

The MCI interface is different from the typical API you find for use with

Fragment 1: Open MCI API.

```
SIGNAL ON SYNTAX name MMPM_NOT_PRESENT
if RxFuncQuery( 'mciRxInit' ) "= 0 then
do
  call RxFuncAdd 'mciRxInit', 'MCI API', 'mciRxInit'
  if RESULT "= 0 then
  do
    say '    Unable to RxFuncAdd MCI API'
    exit
  end
end
call mciRxInit /* will trap on syntax if
               MCI API.DLL not available */
DAPlayer_name = 'DAPlayer'
open_string =,
  'open waveaudio alias' DAPlayer_name 'shareable wait'
open_rc =,
  mciRxSendString( open_string, 'DeviceID', '0', '0' )
```

Fragment 2: Load and play .wav file.

```
/*-----*\
| Load .WAV file if it exists |
\*-----*/
confirmed_path_and_file_name =,
  STREAM( wave_path_and_file_name, 'C', 'QUERY EXISTS' )
if confirmed_path_and_file_name = '' then
do
  iterate k
end
load_string =,
  'load' DAPlayer_name "'confirmed_path_and_file_name'" 'wait'
call mciRxSendString load_string, 'load_return', '0', '0'
/*-----*\
| Play .WAV file |
\*-----*/
play_string =,
  'play' DAPlayer_name 'wait'
call mciRxSendString play_string, 'play_return', '0', '0'
```

REXX, because it requires command strings that include the variable names assigned to any return data for the function being called. Because of a known fallacy in DLL registration using the `RxFuncAdd()` function, it's necessary to monitor for a syntax trap when first referencing `mciapi.dll` [0098-0136]. Fragment 1 contains the code used to issue an **Open** to the MCI API. Fragment 2 contains the code used to load and play the specified .wav file.

The MMPM initialization routine uses the **info** command to obtain the kind of sound card used to play wave audio files and displays that value [0124-0128]. The sound card product name is returned in a field provided within the command string rather than being returned by the function call itself as is frequently the case. The pro-

gram obtains the list of wave audio files from `\mmos2\mmpm.ini` [0030-0058], displays each of the files with the Workplace Shell function with which the sound is associated [0060-0062], and plays the sound file [078-0087].

OS/2 Warp Connect contains REXX-aware DLLs that you can use. `\tcpip\dll\rxftp.dll` and `\tcpip\dll\rxsocket.dll` provide FTP and socket support, respectively. Each is accompanied by a corresponding .inf file in the `\tcpip\doc` subdirectory.

OS/2 Warp Server adds another REXX API named `netutil.dll`. Similar to those APIs found on OS/2 Warp Connect, NETUTIL is accompanied by `netutil.inf`.

Innoval Systems Solutions Inc., of PostRoad Mail fame, has released **Surf'nREXX**, which contains numerous functions that allow a REXX program to perform a multitude of Internet-related

functions. These include **FTPCOPY**, **FTPNEW**, **FTPSend**, **GETMAIL**, **MAILNEW**, **NEWSPost**, **REUTERS**, **SENDNOTE**, **WEBCOPY**, **WEBNEW**, and **WEBCRAWL**. 

Dick Goran is the author of the REXX Reference Summary Handbook, an OS/2 reference. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, Lib 6 on CompuServe or FTPed from <ftp://ftp.cfs-rexx.com/pub>. He can be reached at CompuServe 71154,2002 or via the Internet at dgoran@cfsrexx.com.

Resources:

InterfloX (\$995)

IBM Corp.
(800) 426-3333
WWW <<http://www2.hursley.ibm.com/rexx/rexxfloX.htm>>
READER SERVICE NO. 112

REXX SuperSet/2 (\$79.95)

SoftTouch Systems Inc.
(405) 947-8080
Fax (405) 632-6537
E-mail CIS, OS2VENB, Sec 12 (Felix Cruz 72274,3102)
READER SERVICE NO. 113

REXXLIB (\$20 to \$50), REXXTERM (\$100)

Quercus Systems
(408) 867-REXX
Fax: (408) 867-7489
BBS: (408) 867-7488
CIS, PCVENA, Sec 11 (Charles Daney 75300,2450)
WWW <<http://www.quercus-sys.com>>
READER SERVICE NO. 114

Surf'nREXX (\$39)

Innoval Systems Solutions Inc.
(914) 835-3838
WWW <<http://www.aescon.com/innoval>>
READER SERVICE NO. 115



OS/2 and ISDN— a Nice Combination

BY WAYNE RASH, JR.

Late last night, in fact it was during the wee hours of the morning, I found that I needed a new video driver for a computer that was seeing OS/2 for the first time. I attached to the OS/2 Warp web site (<http://www.austin.ibm.com/pspinfo/os2.html>), downloaded the necessary file, and was off again in seconds. Later, still in the early morning and still working to get OS/2 running at its best, I downloaded the "Just Add OS/2 Warp" kit because the CD-ROM I'd received had been damaged in the mail. It, too, arrived in a few seconds.

I've been spending a lot of time on the World Wide Web these days, retrieving in seconds material that used to take minutes. Likewise, Web pages usually blink on the screen instead of slowly painting themselves on it. I can play RealAudio files, with reasonably decent fidelity, in real time. Using the Internet is a lot more interesting than it used to be, because it's a lot faster.

What I've done, of course, is add ISDN to the office communications suite. For those who aren't familiar with it, ISDN is a digital phone service that provides a much faster path for communications than those analog phone lines with which we're all familiar. In fact, with the right equipment and software, an ISDN line can provide 128 kilobytes per second of throughput, which is about five times as fast as the best analog phone line.

More than just surfing

Of course, ISDN is much more than just speedy Internet access. Because it offers an effective means of high-speed, data-ready, dial-up access, ISDN

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can be used for nearly any type of remote communications, provided it's available where you need it to be.

Right now, accessibility and availability are the keys to the successful use of the phone company's Integrated Services Digital Network with OS/2. However, a number of issues exist here, and not all are OS/2 related, so let's take a look at them in order.

The most basic issue is the availability of the service itself. In some regions, most notably in areas served by Bell Atlantic, Pacific Bell, and Bell-South, ISDN is close to universal. You can have service if you're willing to pay the installation charge, which can run anywhere from \$100 and up. You'll also have to pay a monthly charge that can range from under \$30 to several hundreds of dollars per

month, depending on where you are and what volume of data you move.

The second issue is finding the right equipment and that depends, to some extent, on what you're trying to accomplish. ISDN can work as a replacement for an analog phone line when you're using the Internet, or act as a replacement for a T1 digital line when you're using it as a path for network routing and bridging. As a result, you can get ISDN equipment that works with a single computer to network routers that serve an entire LAN.

The basics

First, make sure you have service. Call your phone company business office and ask. Be prepared to be greeted by ill-informed staffers who may have never heard of the service, since it's still fairly new in some areas. Once you find out you can get service, find out how much it costs. You could discover that ISDN is available in your location, but it's not practical.

Once you've found out you can have it, decide what to do with it. For example, a remote LAN connection from your home office to your company network doesn't require as much speed as does a connection between two busy LANs. Likewise, you need to determine whether your intended caller also has access to ISDN, because it doesn't make sense to get the service only to find out that your Internet provider doesn't support it.

If you have service you can use, then you need to start looking for equipment that will suit your needs. You'll choose the equipment depending on how you're planning to use ISDN, and you'll choose the type of

service accordingly. Finally, the phone company will need to know what you're planning to do, so that they can set the ISDN line up properly (they'll call it provisioning the line).

When you're choosing the line, be aware that there are two types of ISDN service: Primary Rate and Basic Rate. They differ in their cost and the amount of data they can handle. A Primary Rate line, used by companies that need to use ISDN for a combination of voice and data or for high volumes of data, has 16 channels, each of which can transfer information at 64 kilobits per second, as well as a single data channel that is used for signaling and dialing information that runs at 16 kilobits per second. A Basic Rate ISDN line has two 64-kilobit per second channels and one 16-kilobit per second data channel. The high-speed channels are called Bearer channels, which is why you'll often see Basic Rate ISDN referred to as 2B+D.

Getting the right hardware

Three basic types of ISDN hardware are available, which companies use to provide service for their users. They are network routers and bridges, external ISDN interfaces, and internal ISDN interfaces.

Network ISDN routers and bridges really aren't involved with OS/2 at all. They're network devices that are attached to your Ethernet or Token Ring LAN, and they send data packets where they're supposed to go. If they find packets that are addressed to a network that's at the other end of an ISDN line, they connect to a bridge or router at the other end of the line and send the information across. For the vast majority of users, the fact that this is an ISDN connection is transparent.

Of course, for the business that has such a connection, the benefits are obvious. Since ISDN is a dial-up service, you only need a connection when there's a demand. So, your ISDN router can see that it needs to send a packet to the other network, dial up the other network, send the information across, and then shut down. This solution can make high-speed data communications much more affordable than might be the case with, for example, a full-time T1 line.

You should know that the network equipment isn't particularly cheap, and that routers and bridges, even though they can be combined into the same equipment, are different. If you're using a network protocol that can be routed, such as TCP/IP or IPX/SPX, you need a router; if you're using NetBEUI, you need a bridge.

Individual devices

Most users will be more interested in individual ISDN devices for their computers, either as a way for remote LAN access or for connecting to the Internet or an online service. You have to choose between internal and external devices. Of the two, it's probably easier to deal with the external device.

An external ISDN interface looks and acts similar to an external modem, and it attaches to your computer in the same way—through a serial cable. The handy thing about these external ISDN devices is that remote communication programs, which work through a modem, will work through these devices. For example, if you're using a remote session to LAN Server over an analog line, you really only have to replace the modems on each end with ISDN interfaces (and change the type of line, of course) to take advantage of the speed improvements.

Some devices, including the 3Com Impact and the US Robotics I-Modem, are also analog modems. The device lets you dial any computer and can automatically detect whether an ISDN device is on the other end or whether it's an analog modem. Then, it switches to match. This action makes a good backup strategy for companies, because it means that if the ISDN line is down for some reason, their remote users don't have to do anything different to go to a stand-by analog line.

Internal devices are more of a problem, because they require specific support for the operating system on the computer in which they reside. In a sense, they're similar to network interface cards, because they usually require special drivers. Many such devices also work only with Windows and don't support OS/2.

Fortunately, IBM's WaveRunner ISDN interfaces, which also feature analog

modems, work just fine with OS/2. The only disadvantage to IBM's offering is that these interfaces don't include a device called an NT-1, which is required for connection to the ISDN line in the United States. Most manufacturers build an NT-1 into the device, but with IBM's products you'll need to get a separate one, which can cost over \$100. The WaveRunner is available as both an internal ISDN interface and as a PCMCIA card for laptop computers.

For many users, the time has finally come when the combination of hardware, software, and services exists to allow truly high-speed connections while retaining the flexibility of dial-up connections. In a sense, it's the best of both worlds—provided it's available. **OS/2**

Wayne Rash, Jr. is a contributing editor and columnist for Communications Week. He's based in Washington D.C. and edits technology sections for The Washington Post. He can be reached at CompuServe 72205,221 or wrash@interramp.com.

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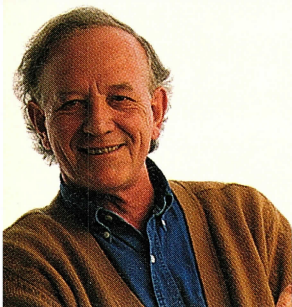
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Déjà Vu Yet Again?

BY STAN KELLY-BOOTLE

OS/2 Warp sales, both connected and disconnected, have been quite sprightly of late, encouraging the publishers to maintain their output of books to help the new and intermediate OS/2 user. In the scramble for catchy titles, alas, two of the leading contenders have independently come up with almost identical rubrics.

From Addison-Wesley comes our own Brian Proffit's *The OS/2 Warp Survival Kit* (\$19.95), reviewed here in January 1996, while John Wiley & Sons offer *The OS/2 Warp Survival Guide* (\$29.95) by Doug Azzarito & David W. Green. (I'll refer to these books as *the Kit* and *the Guide* to reduce eyestrain.) Such namespace near-clashes don't crash the system, but they are a tad embarrassing, rather like coming to a dinner-dance in the same dress as the hostess (or so I'm told—it's never happened to me). If there is blame to be apportioned, Addison-Wesley should take the lion's share. John Wiley & Sons had at least three prior titles using the *X Survival Guide* template.

In any case, I'm not convinced that these survival titles are sending the right message. Is OS/2 Warp being presented as some gator-filled bayou or Bosnian minefield? I hope that the successes of the various client/server books by Orfali, Harkey & Edwards (where *Survival Guide* is eminently appropriate) don't lead to a deluge of survival titles that ape the spate of *dummies* books from IDG. Or perhaps the ultimate bestseller will be *Survival for Dummies*? Might I suggest a nonderivative OS/2 title to guarantee abundant sales?

The two books offer another common factor. Brian Proffit, the author of *the Kit*, and Doug Azzarito, the lead

author of *the Guide*, are respected OS/2 pioneers, "two gurus both alike in dignity," as Shakespeare might say. Proffit is now running Visionary Research, while Azzarito is still with IBM as lead developer of the OS/2 High Performance File System. They have both been unstinting OS/2 evangelists and dispensers of wisdom—Brian, via the "Test Drives" column in *OS/2 Magazine*, and Doug, via the Internet as "The OS/2 Guy."

Proffit's *Kit* and Azzarito's *Guide* differ significantly, avoiding any direct either/or competition. *The Guide* is a \$29.95, 574-page work covering more ground than the \$19.95, 164-page *Kit*, but lacking the latter's useful utilities disk. *The Kit* is aimed squarely at the new OS/2 Warp user and is highly recommended as a first inexpensive, concise, readable, get-oriented text.

In contrast, *the Guide* is ambitiously aimed at novices and experts, stopping at all stations in between. It even has a 13-page chapter on REXX—just enough to whet your appetite. Paragraphs are helpfully tagged with diverse symbols to indicate the content level and target audience: "Skippable on first reading," "Tips for everyone," "New to GUI," "New to OS/2," "Advanced OS/2 users," and so on.

The most intriguing symbol indicates "Undocumented OS/2 feature." With Microsoft Windows, the documenting of undocumented features (a rather Zenish enterprise with instant self-vitiation) has become a major publishing enterprise whereby outsiders reveal the hidden, devious machinations of Uncle Bill. With *the Guide*, we have a different situation—the undocumented features are being revealed from the inside by an IBM'er on the OS/2 team. I suspect that there are usually innocent reasons why

an OS/2 feature shows up in the flesh before it appears in the official canon, such as simple oversights or printing schedules. *The Guide's* definition of *undocumented* is, "You won't find this information in the IBM OS/2 manuals or any other OS/2 manual." Clearly, such claims should be time-stamped. For example, I took two items marked as undocumented and quickly found them in my library. The **BEGINLIBPATH** and **ENDLIBPATH** parameters are discussed in *OS/2 Warp Unleashed, Deluxe Edition* (p. 66), and the use of "D" as the default size parameter for DISKCACHE appears in the *Official Guide to Using OS/2 Warp* (p. 465). I do give *the Guide* the edge in the latter case, because the feature is fully explained with a table of the default sizes invoked by "D."

Doug's coauthor, David W. Green, is an experienced technical author and editor who, judging by *the Guide's* bright text, has earned his share of the royalties.

Summary

The Kit and/or *the Guide*? Raw OS/2 beginners should start with *the Kit*, then move on to *the Guide*. Intermediate and advanced users will find *the Guide* an excellent investment in view of the many insider tips and previously undocumented features. If you still have \$19.95 to spare, rather than blowing it on a bottle of Pernod, buy *the Kit*. The disk alone is worth more. **OS/2**

Stan Kelly-Bootle started computing on EDSAC I at Cambridge over 40 years ago. His latest book is *The Computer Contradictionary* (1995, MIT Press). He welcomes e-mail via CompuServe 70323,1560 or Internet skb@crl.com. Try his Web home page: <http://www.crl.com/~skb>.

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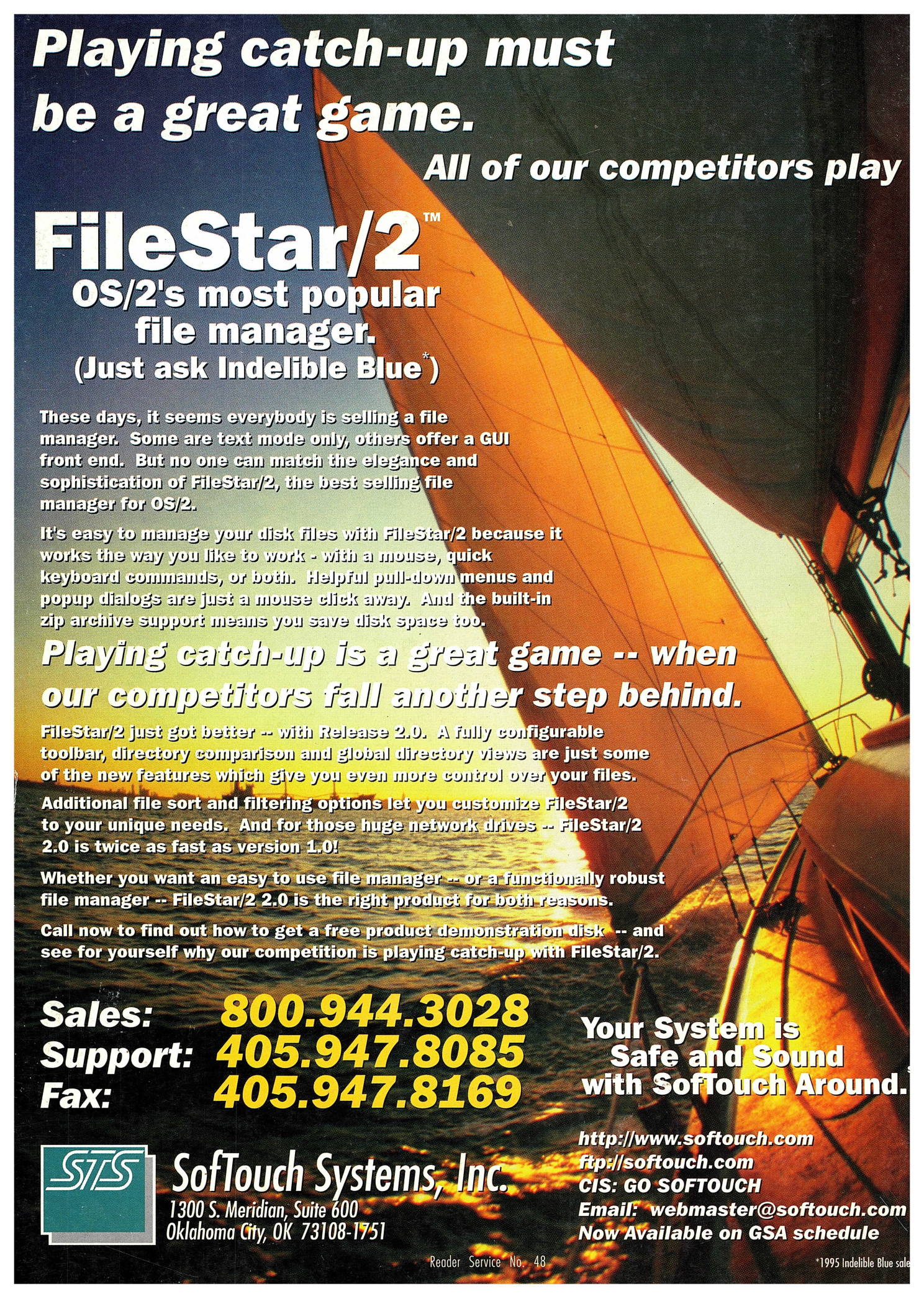
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